

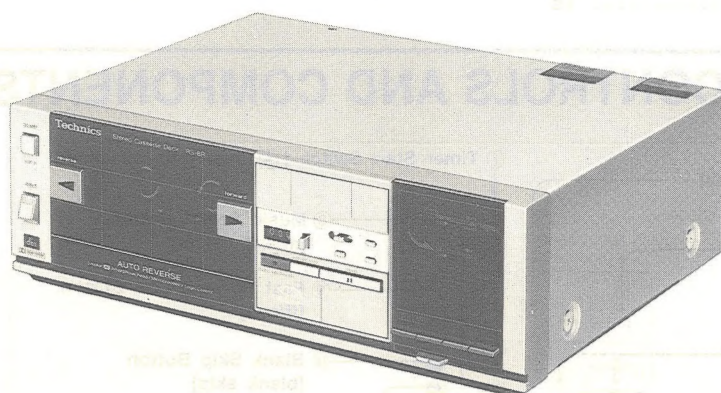
# Service Manual

Cassette Deck

315 Series Mini-Size Auto Reverse  
Cassette Deck with **dbx** System

## RS-8R

(Silver Face)  
(Black Face)



This is the Service Manual for the following areas.

- D** ..... For all European areas except United Kingdom.
- B** ..... For United Kingdom.
- N** ..... For Asia, Latin America, Middle East and Africa areas.
- F** ..... For Asian PX.
- J** ..... For European PX.

RS-8R in black is also available in some countries.

## RS-8R MECHANISM SERIES

### Specifications

Track system:	4-track 2-channel stereo recording and playback	Inputs:	MIC; sensitivity 0.25mV, applicable microphone impedance 400Ω—10kΩ
Tape speed:	4.8cm/s		LINE; sensitivity 60mV, input impedance 47kΩ or more
Wow and flutter:	0.05% (WRMS), ±0.14% (DIN)	Outputs:	LINE; output level 400mV, output impedance 1.5kΩ or less
Frequency response:	Metal tape; 20—17,000 Hz 30—16,000 Hz (DIN) 50—15,000 Hz±3dB CrO <sub>2</sub> tape; 20—17,000 Hz 30—16,000 Hz (DIN) 50—14,000 Hz±3dB Normal tape; 20—16,000 Hz 30—15,000 Hz (DIN) 50—13,000 Hz±3dB	Bias frequency:	80kHz
Dynamic range:	110dB (at 1kHz) with dbx in	Heads:	2-head system 1-AX (AMORPHOUS) head for record/playback 1-double-gap sendust head for erasure
Max. input level		Motor:	Electrical governor motor (×1), DC motor (×2) <b>DB</b> .....3-motor system <b>NFJ</b> .....2-motor system
improvement:	10dB or more improved with dbx in (at 1kHz)	Power requirements:	<b>D</b> .....AC; 220V, 50-60 Hz <b>BNFJ</b> ...AC; 110/125/220/240V, 50-60 Hz
Signal-to-noise ratio:	dbx in; 92dB Dolby B NR in; 67dB (CCIR) NR out; 57dB (Signal level = max. input level A weighted, CrO <sub>2</sub> type tape)		Pre-set power voltage; <b>BN</b> ...; 240V <b>F</b> .....; 125V <b>J</b> .....; 220V
Fast forward and		Power consumption:	12W
rewind time:	Approx. 100 seconds with C-60 cassette tape	Dimensions:	31.5cm(W)×9.9cm(H)×23.9cm(D)
		Weight:	3.8kg

Design and specifications are subject to change without notice.

\*The term dbx is a registered trademark of dbx Inc.

\*\* 'Dolby' and the double-D symbol are trademarks of Dolby Laboratories Licensing Corporation.

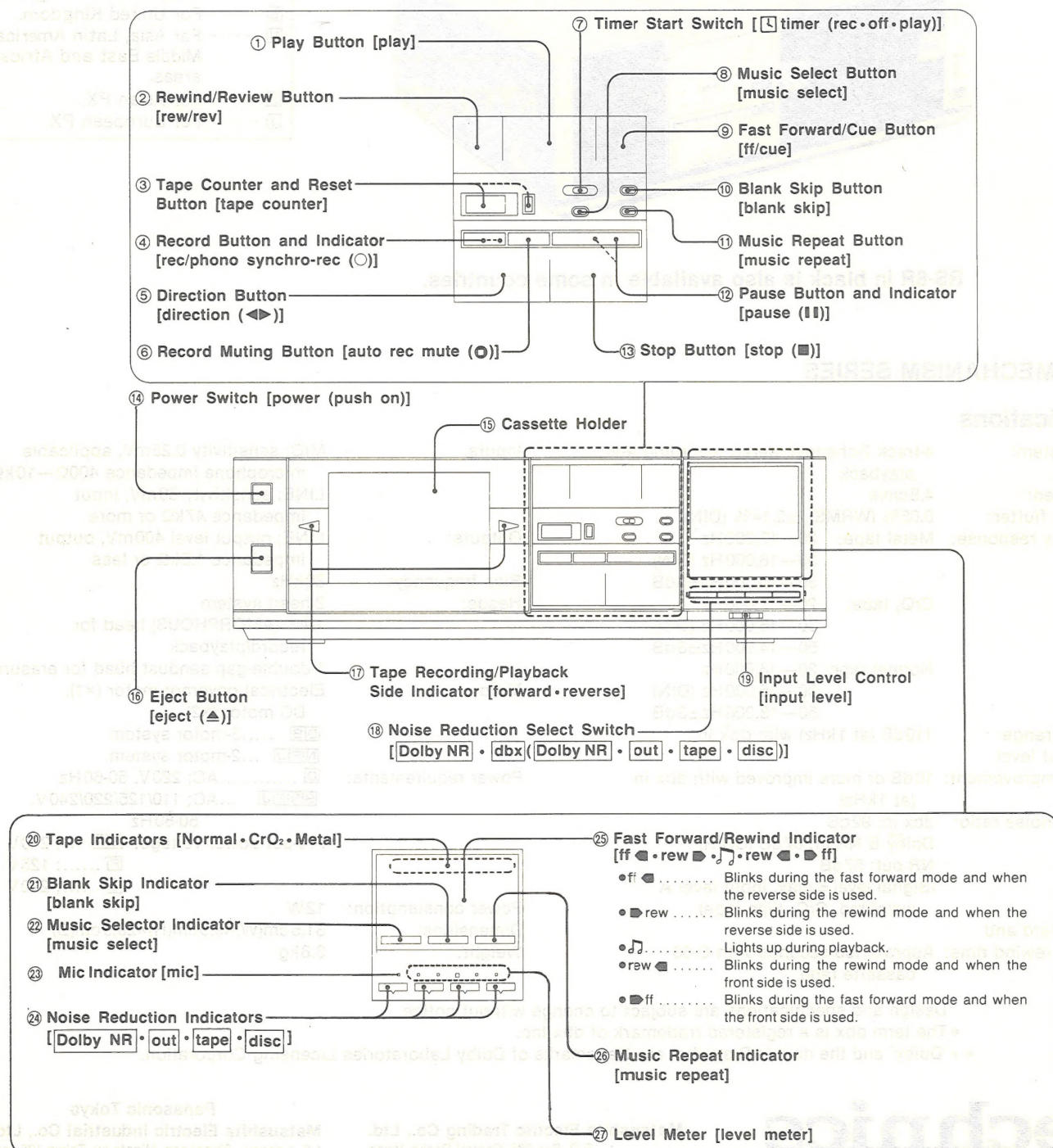
# Technics



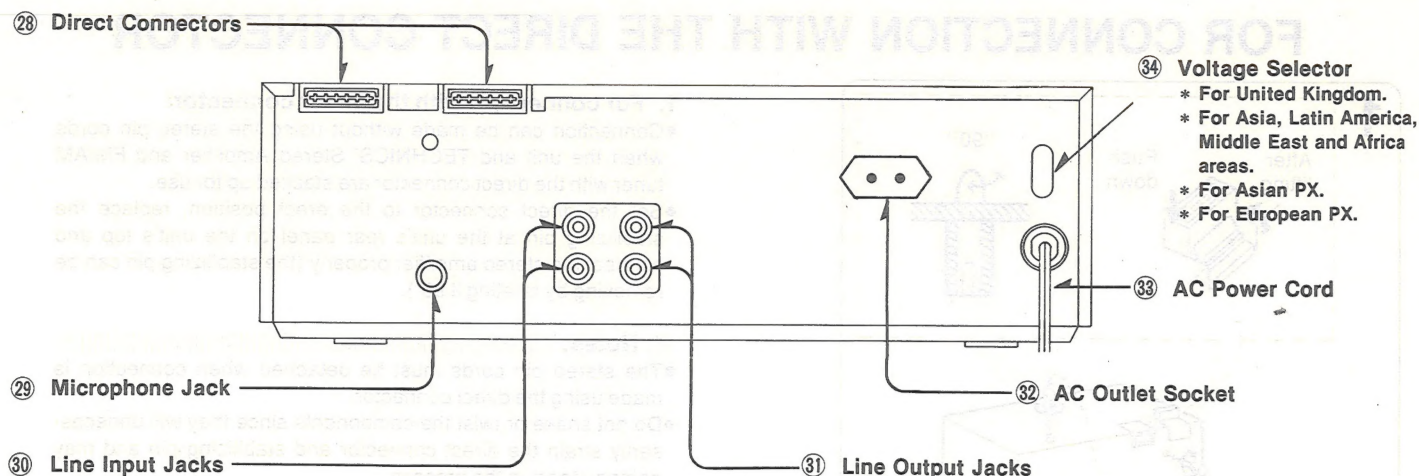
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## LOCATION OF CONTROLS AND COMPONENTS







## OPERATING INSTRUCTION

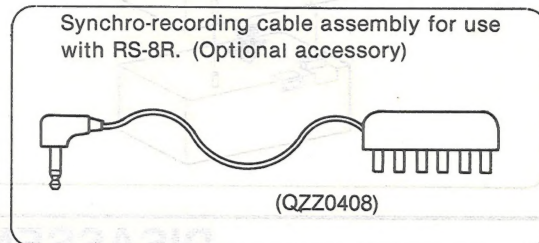
### 1. About Synchro-recording

#### Why use synchro-recording?

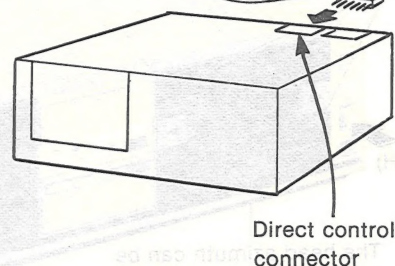
When the tape deck's Record Button is pushed, and the deck placed in the record-pause condition, when the stylus of the tonearm is lowered onto the record surface, the Pause mode will be automatically released and recording will begin. When the stylus leaves the surface of the record, approximately four seconds of non-recorded interval will be allowed to pass before the recording stops automatically. This function is called synchro-recording.

#### NOTE:

For synchro-recording with a system provided with no direct control connector, an optional synchro-recording cable assembly, QZZ0408, is required.



To synchro-recording terminal on player.



INTERCONNECTING

### 2. The Reverse Function

The front side (visible side) or the reverse side can be played back without having to turn the cassette tape around.

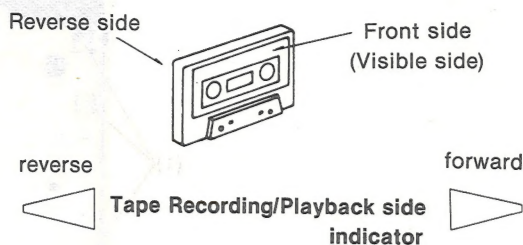
#### Repeat automatic reverse

When the tape has wound to the hub during playback, the repeat automatic reverse mechanism operates and the tape playback side is automatically changed.

Until the Stop Button is pressed, the front side changes to the reverse side, the reverse side to the front side. The operation is repeated 8 times and then automatically stops.

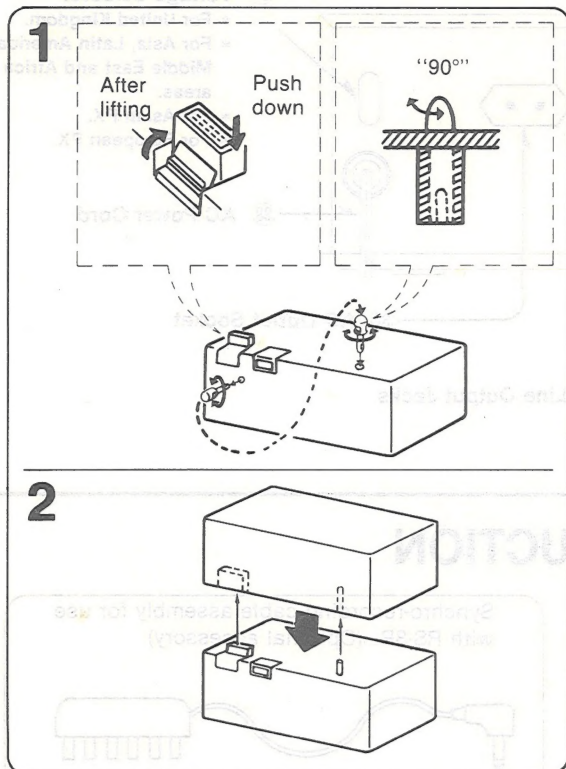
#### Manual reverse

The cassette tape playback side can be changed freely using the Direction Button.





# FOR CONNECTION WITH THE DIRECT CONNECTOR

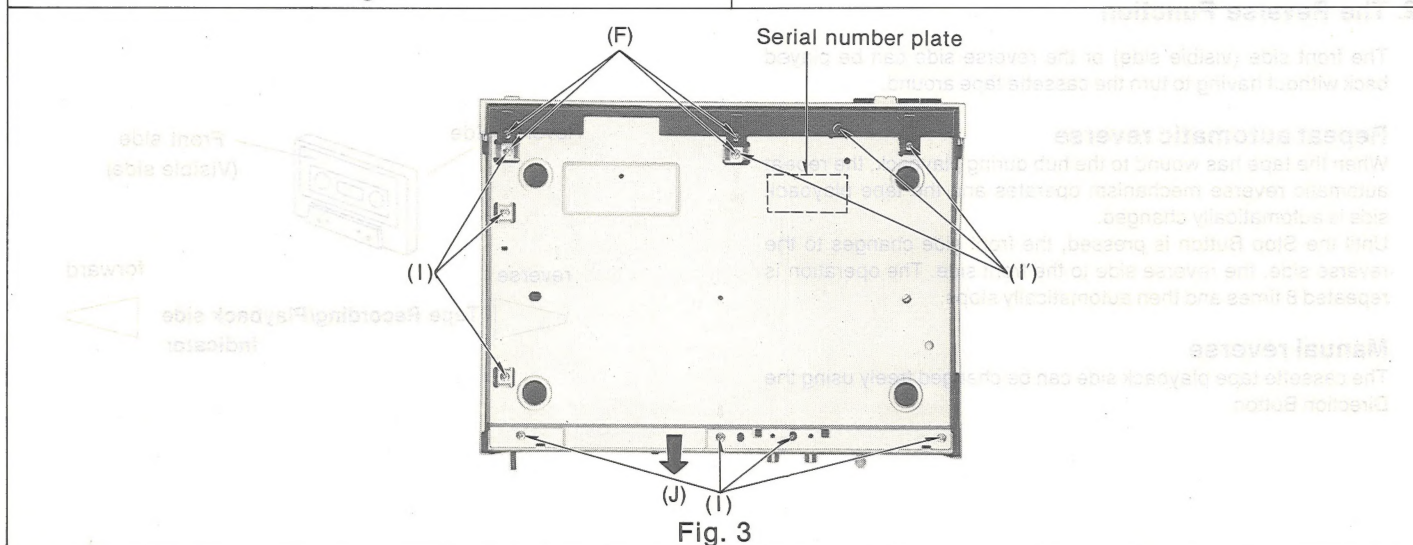
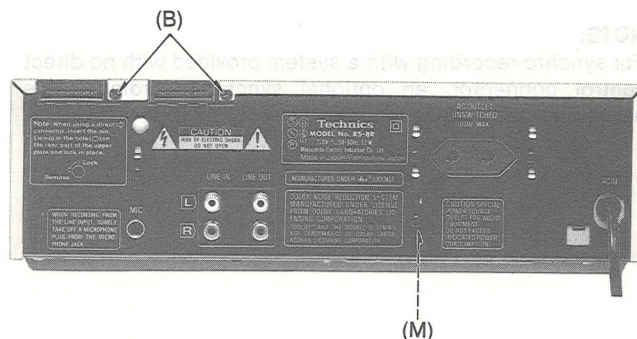
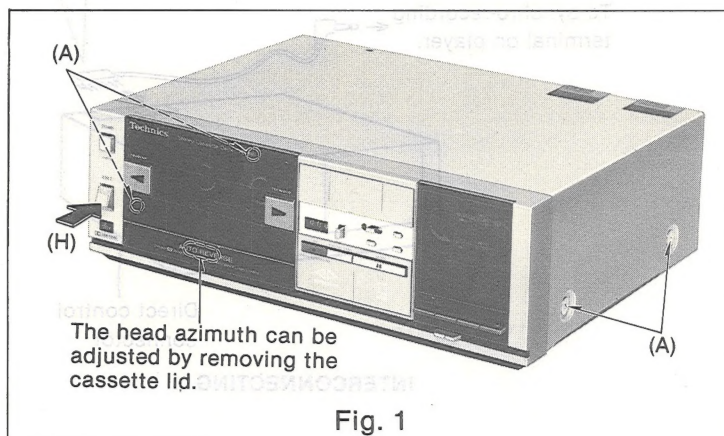


## 1. For connection with the direct connector:

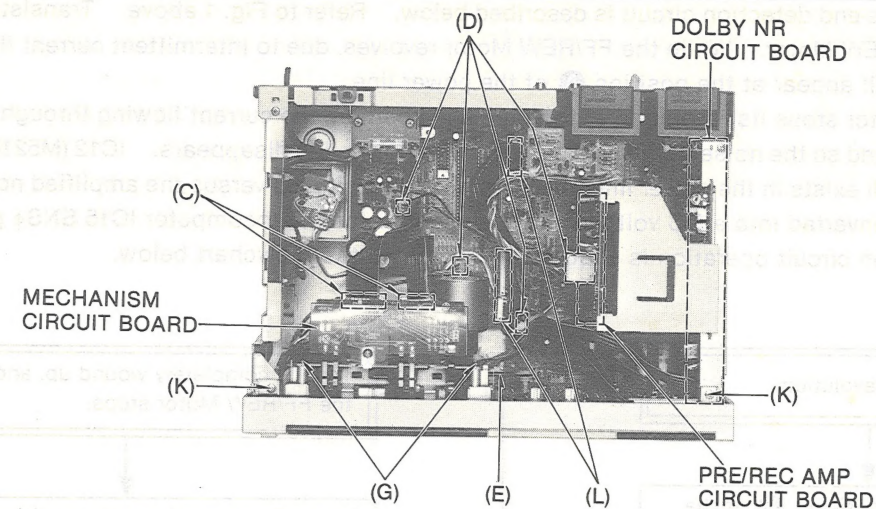
- Connection can be made without using the stereo pin cords when the unit and TECHNICS' Stereo Amplifier and FM/AM tuner with the direct connector are stacked up for use.
- Set the direct connector to the erect position, replace the stabilizing pin at the unit's rear panel on the unit's top and connect the stereo amplifier properly (the stabilizing pin can be removing by rotating it 90°).

- Notes:**
- The stereo pin cords must be detached when connection is made using the direct connector.
  - Do not shake or twist the components since they will unnecessarily strain the direct connector and stabilizing pin and may damage them in the process.

## DISASSEMBLY INSTRUCTIONS







(M) How to remove nylon rivet

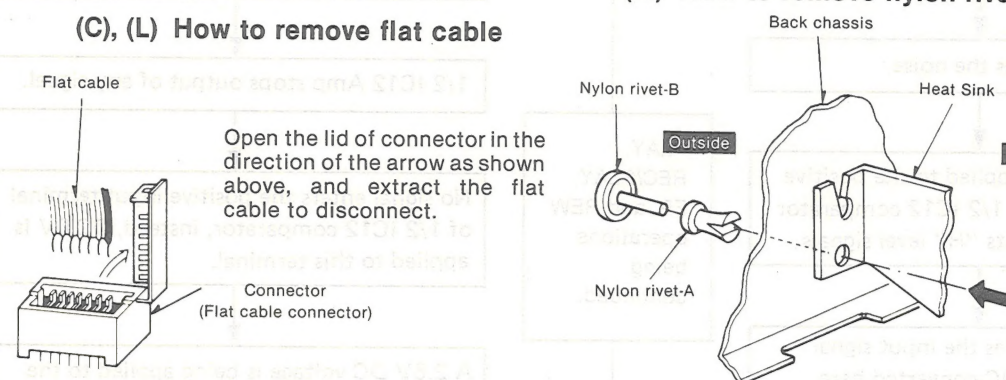


Fig. 4

To remove a heat sink from the back chassis, first press nylon rivet-A from the inside in the direction indicated by the arrow as shown above, and extract the rivet to the outside. Next remove nylon rivet-B from the outside. Consequently, the heat sink can be removed from the back chassis.

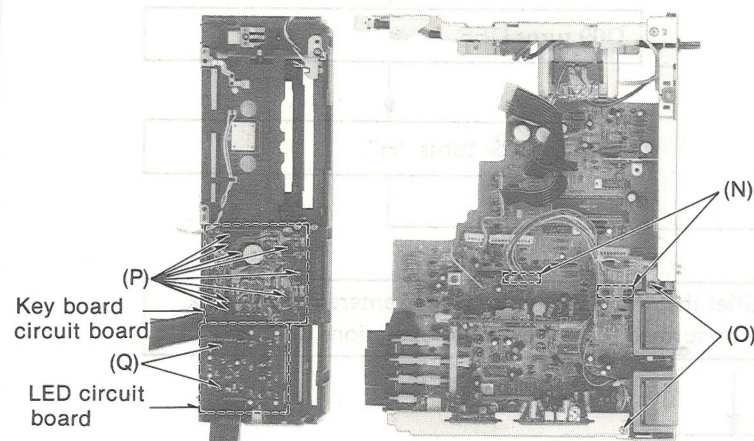


Fig. 5

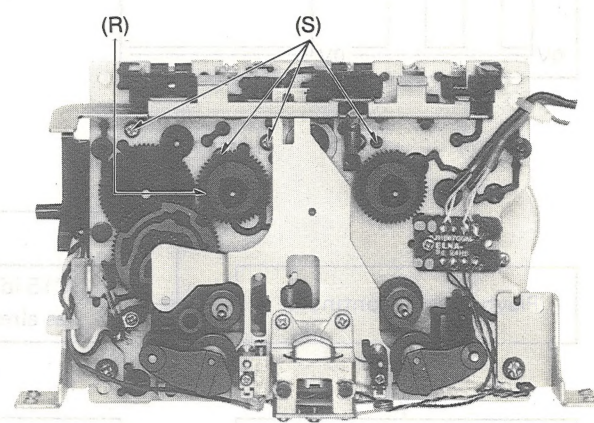


Fig. 6

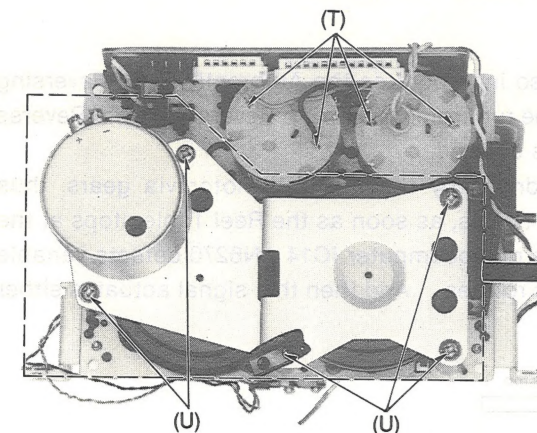


Fig. 7

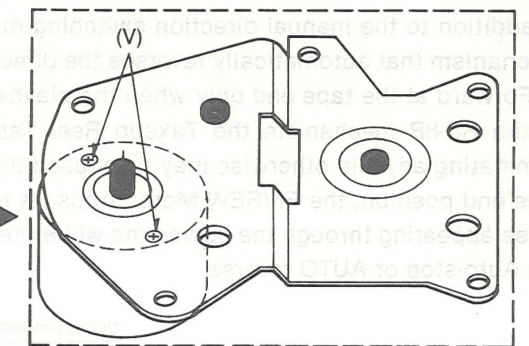


Fig. 8

Ref. No.	Procedure	To remove —	Remove —	Shown in fig. —
1	1	Case cover	• 4 screws .....(A) • 2 screws .....(B)	1 2
2	1 → 2	Mechanism unit	• How to remove flat cable .....(C) • Pull the connector .....(D) • Remove the counter belt .....(E) • 4 screws .....(F) • 2 screws .....(G) • Push the eject button .....(H)	4 4 4 3 4 1
3	3	Bottom cover assembly	• 10 screws .....(I)(I') • Slide the bottom cover assembly in the direction of arrow (J) and remove it.	3 3
4	1 → 2 → 4	Front panel assembly	• 3 screws .....(I') • 2 screws .....(K) • How to remove flat cable .....(L)	3 4 4
5	1 → 2 → 3 → 4	Main circuit board, DOLBY NR circuit board and Pre/Rec AMP circuit board	• How to remove nylon rivet .....(M) • Pull the connector .....(N) • 2 screws .....(O)	2, 4 5 5
6	1 → 2 → 4 → 6	Key board circuit board	• 8 screws .....(P)	5
7	1 → 2 → 4 → 7	LED circuit board	• 2 screws .....(Q)	5
8	1 → 2 → 8	FF/REW motor and Driver motor	• Remove the reel table .....(R) • 4 screws .....(S) • Unsolder the soldered portion of the FF/REW motor terminal and driver motor terminal .....(T)	6 6 7
9	1 → 2 → 8	Capstan motor	• 5 screws .....(U) • 2 screws .....(V)	7 8

#### \* Serial No. Indication.

The serial number plate of this product is attached to the bottom cover (shown in Fig. 3).

Operation mode	Voltage	Voltage	Takeup torque
Forward Playback	0.5V	3.5V	50g·cm
Forward FF	0V	6.5V	100g·cm
Reverse Playback	3.5V	0.5V	50g·cm
Reverse FF	6.5V	0V	100g·cm

Motor: Each terminal voltage value represents the voltage between terminal and the ground.



TECHNICAL EXPLANATION

Tape End Detection Mechanism

In addition to the manual direction switching means, RS-8R also incorporates the Automatic Tape Reversing mechanism that automatically reverses the directions of the tape run from Forward to Reverse or from Reverse to Forward at the tape end only when the playback operation is entered.

In the RS-8R mechanism the Takeup Reel Table is directly driven by the FF/REW Motor via gears, thus eliminating any slip otherwise may be caused by friction. Due to this, as soon as the Reel Table stops at the tape end position, the FF/REW Motor stops its revolution. The microcomputer IC14 AN6270 detects variable noise appearing through the power line while the FF/REW Motor rotates. And then this signal actuates either the Auto-stop or AUTO reverse.

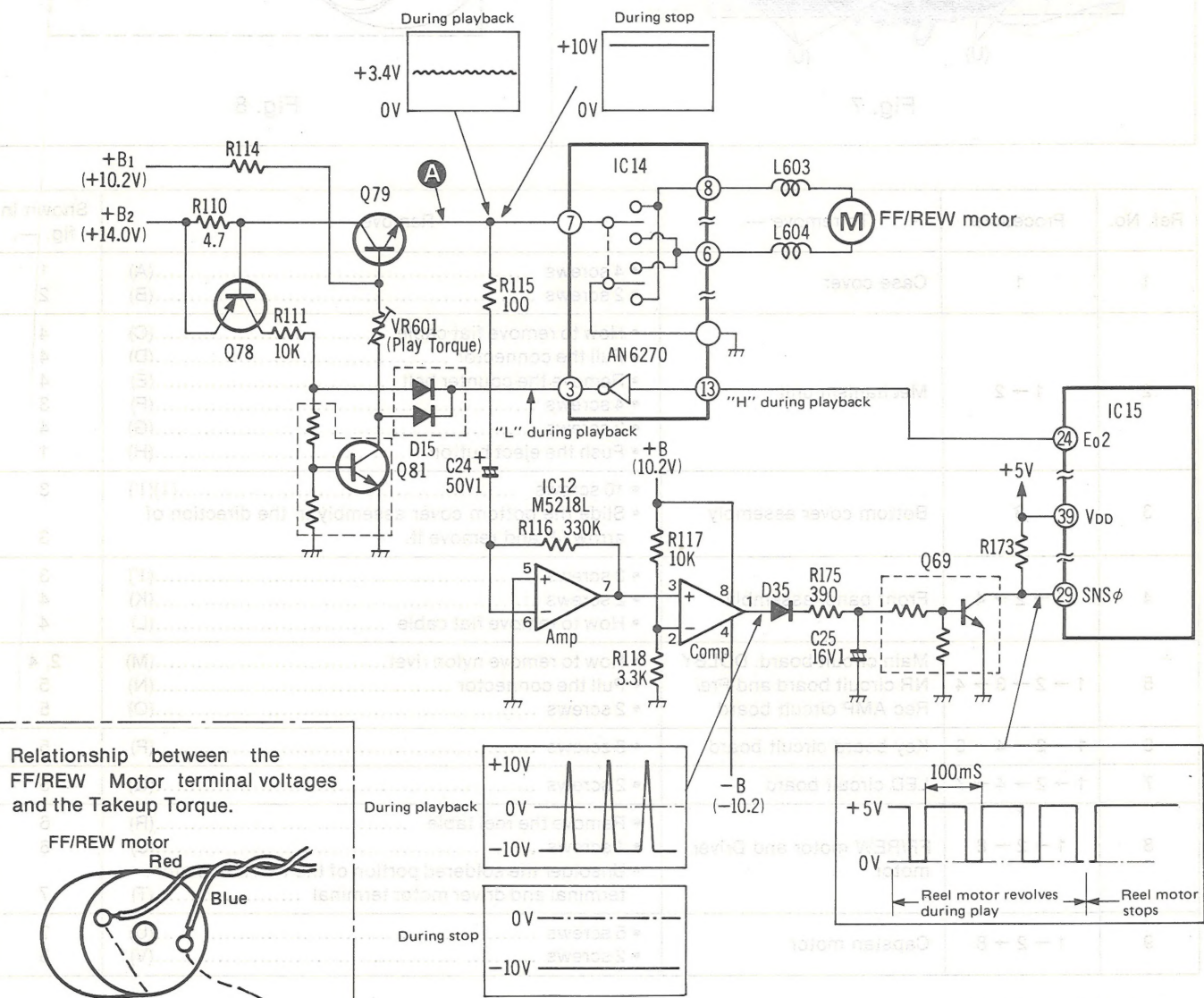


Fig. 1 The tape-end detection circuit

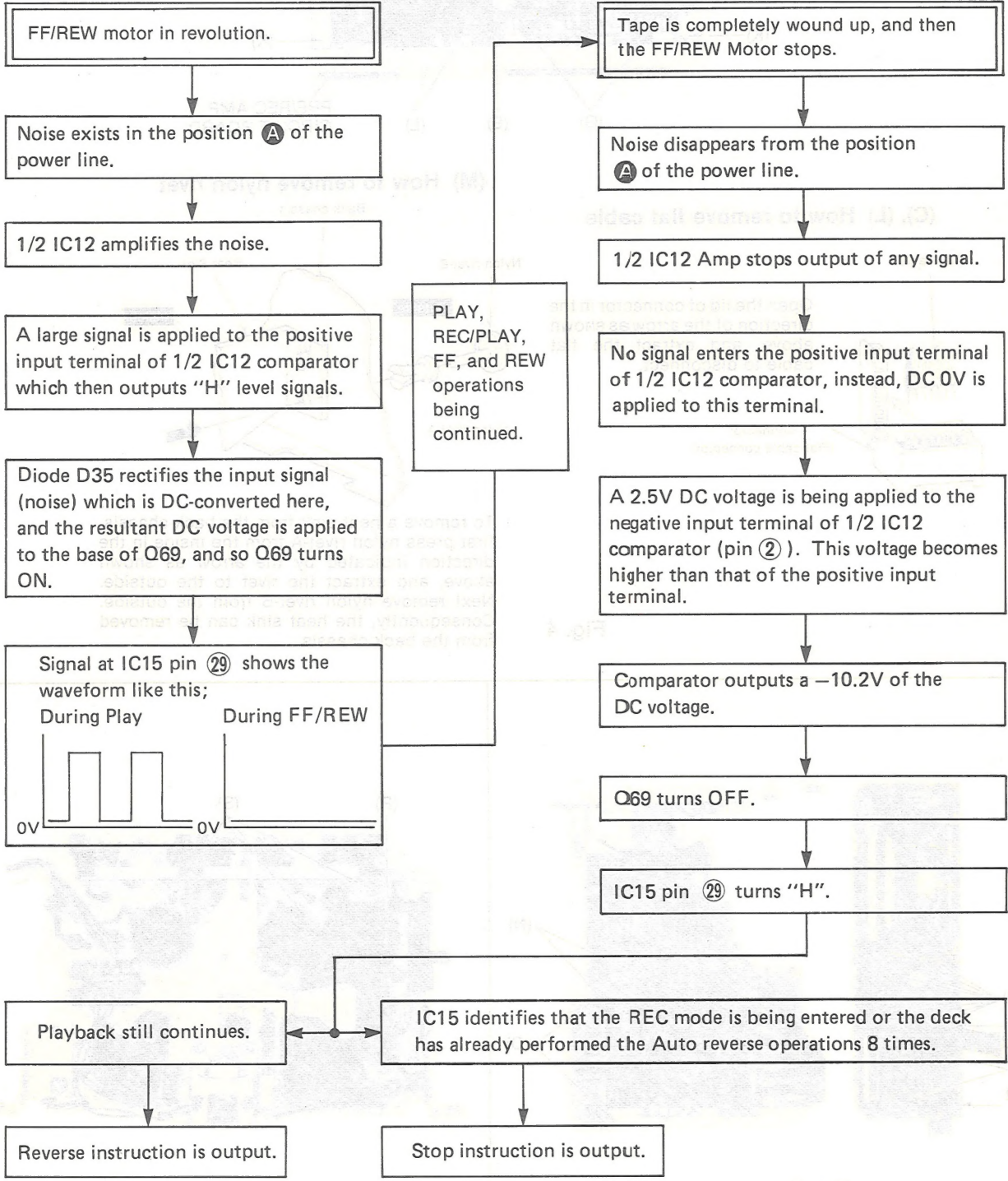
Operation mode	Voltage	Voltage	Takeup torque
Forward Playback	0.2V	3.7V	50g • cm
Forward FF	0V	9.4V	150g • cm
Reverse Playback	3.7V	0.2V	50g • cm
Reverse FF	9.4V	0V	150g • cm

Note: Each terminal voltage value represents the voltage between terminal and the ground.

Operations of the Tape-end detection circuit is described below. Refer to Fig. 1 above. Transistor Q79 feeds the power to the FF/REW Motor. While the FF/REW Motor revolves, due to intermittent current flowing to the amateur coil, noise will appear at the position A of the power line.

When the FF/REW Motor stops its revolution at the tape end position, the current flowing through the amateur coil becomes stable, and so the noise at the position A of the power line disappears. IC12 (M5218L) amplifies such noise while it still exists in the power line, then compares the signals versus the amplified noise, which is then rectified to be converted into a DC voltage and then sent to the microcomputer IC15 SNSφ pin 29.

The Tape-end detection circuit operation is sequentially shown in the Flowchart below.

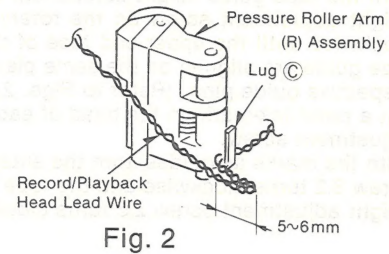
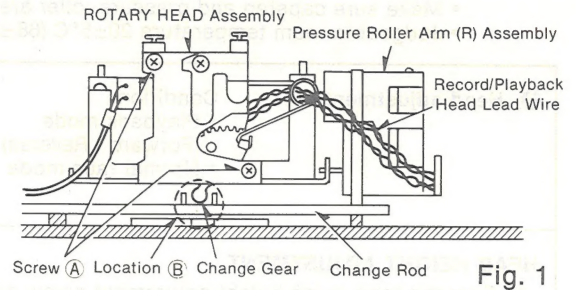




## REPLACING ROTARY HEAD ASSEMBLY

### Considerations in mounting the rotary head assembly

1. This recorder requires a record/playback head of extremely precise head height. In replacing the rotary head, install a factory-adjusted full rotary head assembly.  
[Never attempt to disassemble the rotary head assembly by removing screws (A).]
2. In installing the replacement rotary head assembly, make certain that the change gear is placed at location (B) on the change rod. (See Fig. 1.)
3. Trace the record/playback head lead-wire as follows (Refer to Fig. 2):
  - Set the record/playback head in its forward playback direction.
  - Pass the head lead-wire through the lug (C) on the pressure roller arm (R) assembly.
  - Slacken the wire between the head assembly and the lug (C) (by making a 5 or 6mm turnup near the lug (C)).



## MEASUREMENT AND ADJUSTMENT METHODS

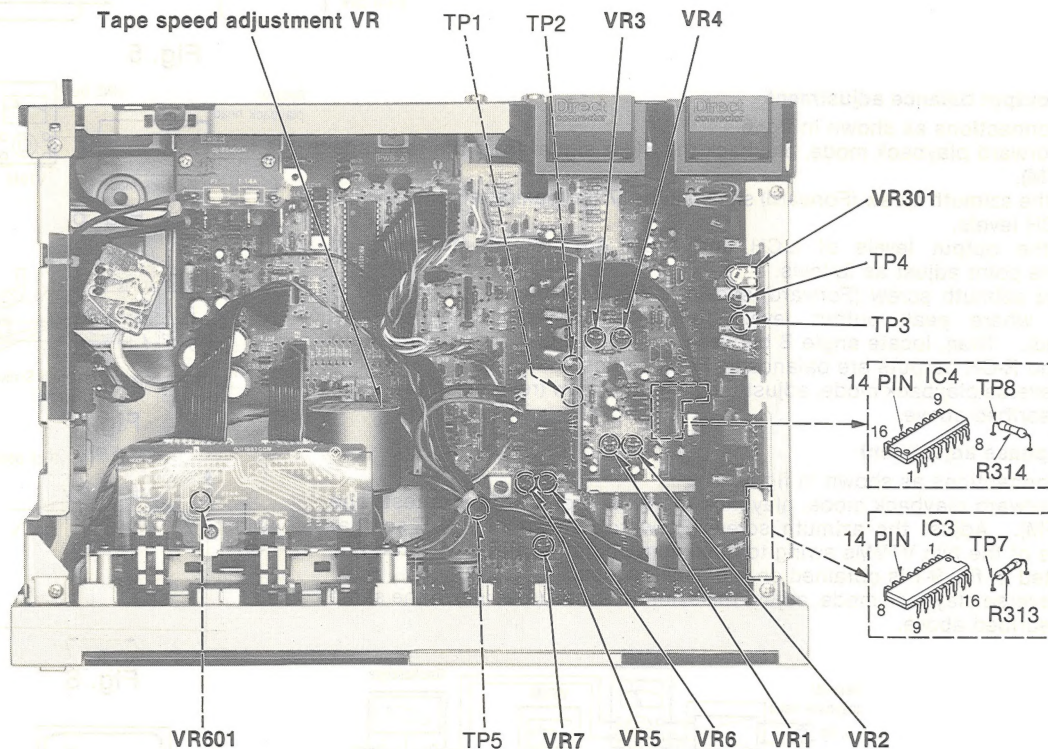


Fig. 1



**NOTES:** Set switches and controls in the following positions, unless otherwise specified.

- Make sure heads are clean
- Make sure capstan and pressure roller are clean
- Judgeable room temperature  $20 \pm 5^\circ\text{C}$  ( $68 \pm 9^\circ\text{F}$ )

- NR switch: OUT
- Timer start switch: OFF
- Input level control: Maximum

#### A Head adjustment

Condition:

- Playback mode (Forward • Reverse)
- Normal tape mode

Equipment:

- VTVM
- Oscilloscope
- Test tape (azimuth)...QZZCFM
- Test tape .....QZZCRD

#### HEAD HEIGHT ADJUSTMENT

1. Turn the tape guide height adjustment screw and the erase head height adjustment screw on the rotary head assembly counter-clockwise until the upper end face of the erase head and of the tape guide are aligned on the same plane as the top face of their respective guide pins. (Refer to Figs. 2, 3 and 4).
2. Put a point ink-mark on the head of each adjustment screw.
3. With the marks as guides, turn the erase head height adjustment screw 3.2 turns clockwise and the tape guide height adjustment screw 2.5 turns clockwise.
4. Install a test tape (tape with mirror: QZZCRD) on the recorder; place the recorder in the FORWARD PLAY mode. Make fine adjustments of the erase head height and tape guide height adjustment screws as necessary, to attain on the recording/reproducing head face the tape position shown in Fig. 5.
5. Run the tape in the forward play mode and check it for zigzag running. (Shown in Fig. 5)  
If zigzag tape running occurs, repeat step 4.
6. Place the recorder in the reverse play mode and perform the above steps 4 and 5.
7. Repeat steps 5 and 6 two or three times and verify that the tape position shown in Fig. 5 is ensured.

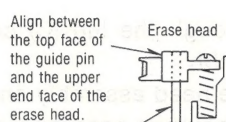
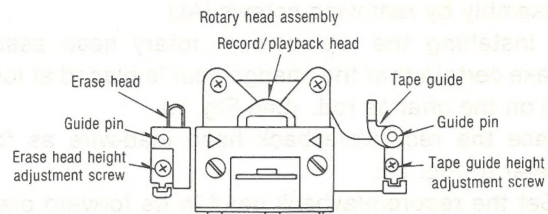


Fig. 3

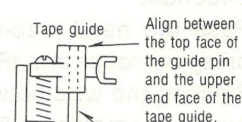


Fig. 4

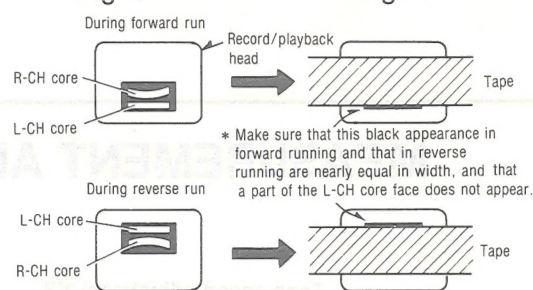


Fig. 5

#### L-CH/R-CH output balance adjustment

8. Make connections as shown in fig. 6.
9. In the forward playback mode, playback the 8kHz signal from the test tape (QZZCFM).  
Adjust the azimuth screw (Forward) shown in fig. 7 for maximum output L-CH and R-CH levels.  
When the output levels of L-CH and R-CH are not at maximum at the same point adjust as follows.
10. Turn the azimuth screw (Forward) shown in fig. 7 to find angles A and C (points where peak output levels for left and right channels are obtained). Then, locate angle B between angles A and C, i.e., point where L-CH and R-CH outputs are balanced. (Refer to figs. 7 and 8.)
11. In the reverse playback mode, adjust the azimuth screw (reverse) in the same way described above.

#### L-CH/R-CH phase adjustment

12. Make connections as shown in fig. 9.
13. In the forward playback mode, playback the 8kHz signal from the test tape (QZZCFM). Adjust the azimuth screw (Forward) shown in fig. 7 so that pointers of the two VTVMs swing to maximum and a lissajous waveform as illustrated in fig. 9-1 is obtained on the oscilloscope.
14. In the reverse playback mode, adjust the azimuth screw (reverse) in the same way described above.

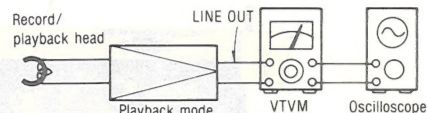


Fig. 6

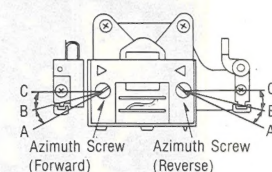


Fig. 7

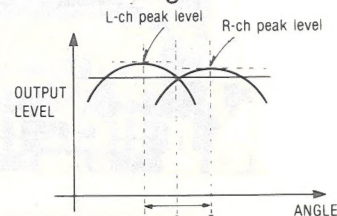


Fig. 8

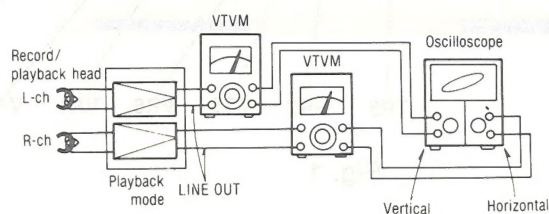


Fig. 9

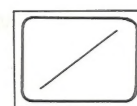


Fig. 9-1



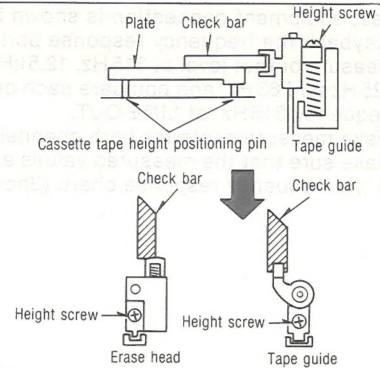
**Checking the difference in level between forward and reverse running**

15. Reproduce the playback level adjustment signal (315Hz at 0dB) on the standard playback adjustment tape, and check that the difference between the level in forward running and that in reverse running is within 1.0dB.
16. After adjustment, lock the erase head height, tape guide height and angle adjustment screws.

**Head Height Adjustment using the Head Adjustment Jig (QZZ0207)**

The head adjustment jig (QZZ0207) enables accurate, speedy head height adjustment in the following manner.

- a. Place the plate onto the mechanism.
- b. Set the mechanism to the PLAY mode.
- c. Place the check bar onto the plate.
- d. Pass the check bar through each tape guide.
- e. Adjust the height screw so that the check bar does not touch any of the tape guides.
- f. Run a mirror tape (QZZCRD) and check to see that the tape does not touch (twist around, etc.) the tape guide.
- g. After that, adjust items 4 thru 13 in the adjustment procedure.

**Ⓑ Takeup torque**

Condition:  
• Playback mode

Equipment:  
• DC voltmeter  
• Test tape...QZZSRKCT

1. Adjust the takeup torque adjusting potentiometer VR601 in the forward playback mode for 3.5 volts between the FF/REW motor terminals.
2. Run the QZZSRKCT takeup torque measurement tape in the forward playback mode and check that the torque is within quoted tolerances.

**Standard value: 50±10gr-cm**

**Ⓒ Tape speed**

Condition:  
• Playback mode

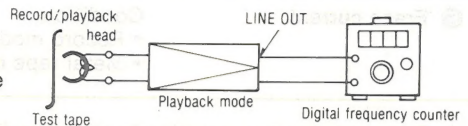
Equipment:  
• Digital frequency counter  
• Test tape...QZZCWAT

**Tape speed accuracy**

1. Test equipment connection is shown in fig. 10.
2. Playback test tape (QZZCWAT 3,000Hz), and supply playback signal to the digital frequency counter.
3. Measure this frequency.
4. On the basis of 3,000Hz, determine value by following formula:  

$$\text{Tape speed accuracy} = \frac{f - 3,000}{3,000} \times 100(\%) \quad \text{where, } f = \text{measured value}$$
5. Take measurement at middle section of tape.

**Standard value: ±1.5%**



**Fig. 10**

6. If measured value is not within the standard value, adjust it by using the tape speed adjustment VR shown in Fig. 1.

**Tape speed fluctuation**

Make measurements in same manner as above (beginning, middle and end of tape), and determine the difference between maximum and minimum values and calculate as follows:

$$\text{Tape speed fluctuation} = \frac{f_1 - f_2}{3,000} \times 100(\%) \quad f_1 = \text{maximum value, } f_2 = \text{minimum value}$$

**Standard value: Less than 1%**

**NOTE:**

Please use non metal type screwdriver when you adjust tape speed on this unit.



⑩ Playback frequency response

- Condition:
- Playback mode (Forward • Reverse)
  - Normal tape mode

- Equipment:
- VTVM
  - Oscilloscope
  - Test tape...QZZCFM

1. Test equipment connection is shown in fig. 5.
2. Playback the frequency response portion of test tape (QZZCFM).
3. Measure output level at 315Hz, 12.5kHz, 8kHz, 4kHz, 1kHz, 250Hz, 125Hz and 63Hz, and compare each output level with the standard frequency 315Hz, at LINE OUT.
4. Make measurements for both channels.
5. Make sure that the measured values are within the range specified in the frequency response chart. (Shown in fig. 11).

Playback frequency response (Forward • Reverse)

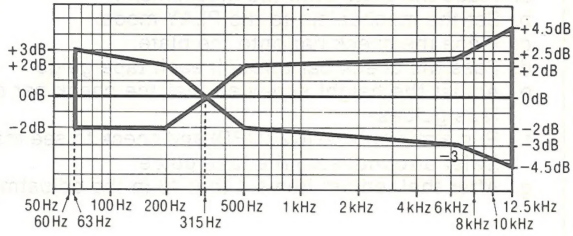


Fig. 11

⑪ Playback gain

- Condition:
- Playback mode
  - Normal tape mode

- Equipment:
- VTVM
  - Oscilloscope
  - Test tape...QZZCFM

1. Test equipment connection is shown in fig. 6.
2. Playback standard recording level portion on test tape (QZZCFM 315Hz) and, using VTVM, measure the output level at test points [TP7 (L-CH), TP8 (R-CH)].
3. Make measurements for both channels.

Standard value: 0.4±0.02V [around 0.42V: at test points TP7 (L-CH) and TP8 (R-CH)]

Adjustment

1. If the measured value is not within standard the adjust VR1 (L-CH) or VR2 (R-CH) (See fig. 1).
2. After adjustment, check "Playback frequency response" again.

⑫ Erase current

- Condition:
- Record mode
  - Metal tape mode

- Equipment:
- VTVM
  - Oscilloscope

1. Test equipment connection is shown in fig. 12.
2. Place UNIT into metal tape mode.
3. Press the record and pause buttons.
4. Read voltage on VTVM and calculate erase current by following formula:

$$\text{Erase current (A)} = \frac{\text{Voltage across resistor R20}}{1 (\Omega)}$$

Standard value: 155±15mA (Metal)

5. If the measured value is not within standard value, adjust VR7 (shown in fig. 1).

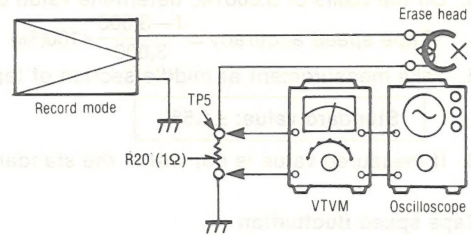


Fig. 12

⑬ Overall frequency response

- Condition:
- Record/playback mode
  - Normal tape mode
  - CrO<sub>2</sub> tape mode
  - Metal tape mode
  - Input level control...MAX

- Equipment:
- VTVM
  - ATT
  - AF oscillator
  - Oscilloscope
  - Resistor (600Ω)
- Test tape (reference blank tape)  
...QZZCRA for Normal  
...QZZCRX for CrO<sub>2</sub>  
...QZZCRZ for Metal



**Note:**

Before measuring and adjusting, the overall frequency response make sure of the playback frequency response (For the method of measurement, please refer to the playback frequency response).

(Recording equalizer is fixed)

1. Make connections as shown in fig. 13.
2. Place UNIT into normal tape mode and insert the normal reference blank test tape (QZZCRA).
3. Supply a 1kHz signal from the AF oscillator through ATT to LINE IN.
4. Adjust ATT so that input level is  $-20\text{dB}$  below standard recording level (standard recording level =  $0\text{ VU}$ ).
5. Adjust the AF oscillator frequency to 1kHz, 50Hz, 100Hz, 200Hz, 500Hz, 4kHz, 8kHz, 10kHz and 12.5kHz signals, and record these signals on the test tape.
6. Playback the signals recorded in step 6, and check if the frequency response curve is within the limits shown in the overall frequency response chart for normal tapes (fig. 14).  
(If the curve is within the charted specifications, proceed to steps 7, 8 and 9.)  
If the curve is not within the charted specifications, adjust as follows;

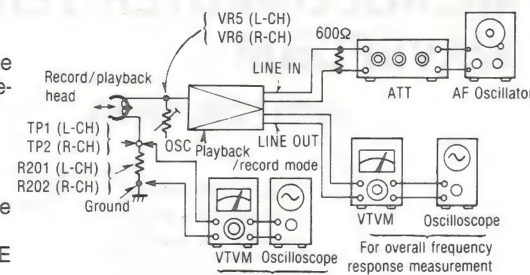


Fig. 13

Overall frequency response chart (Normal)

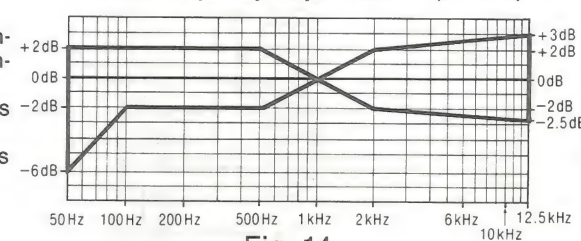


Fig. 14

**Adjustment (A):**

When the curve exceeds the overall specified frequency response chart (fig. 14) as shown in fig. 15.

- 1) Increase bias current by turning VR5 (L-CH) and VR6 (R-CH).  
(See fig. 1 on page 9.)
- 2) Repeat steps 5 and 6 for confirmation (Proceed to steps 7, 8 and 9 if the curve is now within the charted specifications as shown fig. 14.)
- 3) If the curve still exceeds the specifications (fig. 14), increase bias current further and repeat steps 5 and 6.

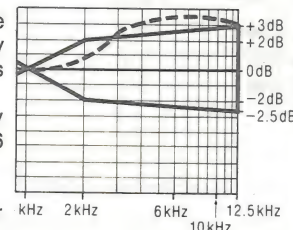


Fig. 15

**Adjustment (B):**

When the curve falls below the overall specified frequency response chart (fig. 14) as shown in fig. 16.

- 1) Reduce bias current by turning VR5 (L-CH) and VR6 (R-CH).
- 2) Repeat steps 5 and 6 for confirmation (Proceed to steps 7, 8 and 9 if the curve is now within the charted specifications as shown fig. 14.)
- 3) If the curve still falls below the charted specifications (fig. 14), reduce bias current further and repeat steps 5 and 6.

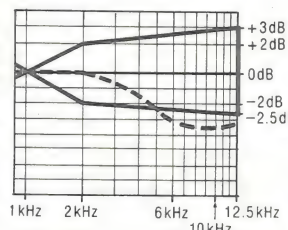


Fig. 16

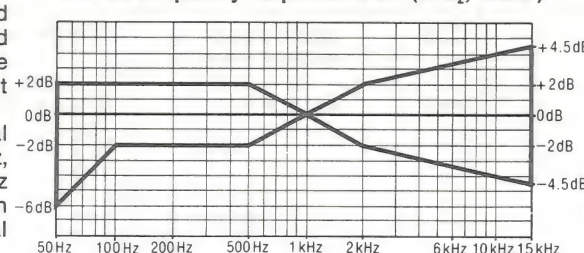
Overall frequency response chart (CrO<sub>2</sub>, Metal)

Fig. 17

7. Place UNIT into CrO<sub>2</sub> tape mode.
8. Change test tape to CrO<sub>2</sub> reference blank test tape (QZZCRX), and record 1kHz, 50Hz, 100Hz, 200Hz, 500Hz, 4kHz, 8kHz, 10kHz and 15kHz signals. Then, playback the signals and check if the curve is within the limits shown in the overall frequency response chart for CrO<sub>2</sub> tapes (fig. 17).
9. Place UNIT into metal tape mode and change test tape to metal reference blank test tape (QZZCRZ), and record 1kHz, 50Hz, 100Hz, 200Hz, 500Hz, 4kHz, 8kHz, 10kHz, 12.5kHz and 15kHz signals. Then, playback the signals and check if the curve is within the limits shown in the overall frequency response chart for metal tapes (fig. 17).
10. Confirm that bias currents are approximately as follows when the UNIT is set at different tape mode.

- Read voltage on VTVM between ground and test point (TP1 for L-CH, TP2 for R-CH) and calculate bias current by following formula:

$$\text{Bias current (A)} = \frac{\text{Value read on VTVM (V)}}{10 (\Omega)}$$

Standard value: around 200μA (Normal position)  
around 300μA (CrO<sub>2</sub> position)  
around 400μA (Metal position)

**H Overall gain****Condition:**

- Record/playback mode
- Normal tape mode
- Input level controls...MAX
- Standard input level;  
MIC .....  $-72 \pm 4\text{dB}$   
LINE IN .....  $-24 \pm 4\text{dB}$

**Equipment:**

- VTVM
- ATT
- Resistor (600Ω)
- Test tape (reference blank tape) ...QZZCRA for Normal
- AF oscillator
- Oscilloscope

1. Test equipment connection is shown in fig. 18.
2. Insert the normal reference blank tape (QZZCRA).
3. Place UNIT into record mode.
4. Supply a 1kHz signal through ATT ( $-24\text{dB}$ ) from AF oscillator, to LINE IN.
5. Adjust ATT until monitor level at LINE OUT becomes  $0.38\text{V}$ .
6. Playback recorded tape, and make sure that the output level at LINE OUT becomes  $0.38\text{V}$ .
7. If measured value is not  $0.4\text{V} \pm 2\text{dB}$ , adjust it by using VR3 (L-CH) or VR4 (R-CH).
8. Repeat from step (2).

Standard value:  $0.4\text{V} \pm 2\text{dB}$

[around  $0.42\text{V}$ : at test points TP7 (L-CH) and TP8 (R-CH)]

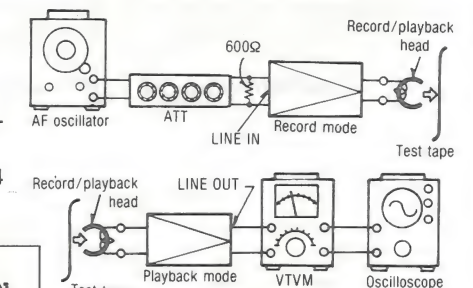


Fig. 18

**I Dolby NR circuit****Condition:**

- Record mode
- Dolby NR switch...IN/OUT
- Input level control...MAX

**Equipment:**

- VTVM
- ATT
- Resistor (600Ω)
- AF oscillator
- Oscilloscope

1. Make connections as shown in fig. 19.
2. Set the unit to the record mode. (NR select switch is OUT.)
3. Apply a 1kHz signal to LINE IN.
4. Adjust the ATT so that the output level at TP7 (L-CH) and TP8 (R-CH) is  $17.5\text{mV}$ .
5. The output level at pin 14 should be  $0\text{dB}$ .
6. Set the NR select switch to IN, and make sure that the output signal level at pin 14 of IC3 (L-CH) and IC4 (R-CH) is  $+6\text{dB} \pm 1.5\text{dB}$ .
7. Set the NR select switch to OUT, and adjust the frequency to 5kHz. The output signal level at pin 14 should be  $0\text{dB}$ .
8. Set the NR select switch to IN and make sure that the output signal level at pin 14 of IC3 (L-CH) and IC4 (R-CH) is  $+8\text{dB} \pm 1.5\text{dB}$ .

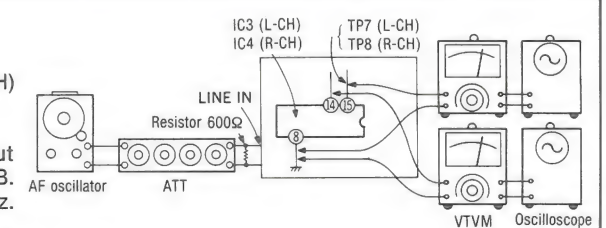


Fig. 19

**J Attack recovery time adjustment (dbx circuit)****Condition:**

- Record mode
- Input level control...MAX
- Noise reduction selector ...dbx tape

**Equipment:**

- VTVM
- ATT
- AF oscillator
- DC voltmeter

1. Make the connections as shown in fig. 20 and apply 1kHz  $-27\text{dB}$  signal from LINE IN, and set the noise reduction selector to dbx tape position.
2. Set the unit to record mode, adjust ATT so that the signal level at C361 (L-CH) and C362 (R-CH) is  $300\text{mV}$ .
3. Read voltage on DC voltmeter.

Reference value:  $15 \pm 0.5\text{mV}$

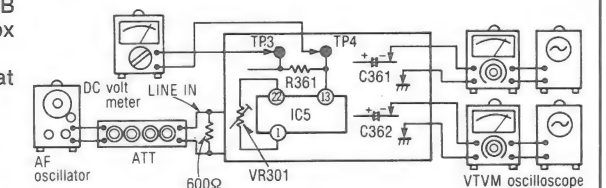


Fig. 20

4. If measured value is not within reference, adjust VR301 (shown in fig. 1).



K

Input scanning time adjustment

Condition:

• Stop mode

Equipment:

• Oscilloscope

1. Place the recorder in the stop mode.

2. Connect an oscilloscope to pin 31 of IC15, as shown in Fig. 21.

3. If the measured value is not within standard value, correct it by opening or closing the jumper junctions (A) and (B) as follows (See Fig. 22):
- After closing (A) and opening (B), read the resulting value.

• If it is less than 70Hz, close (B).

• If more than 120Hz, open (A) but close (B).

• If opening (A) and closing (B) do not cause the reading to be less than 120Hz, open both (A) and (B).

Standard value:  $100 \pm 20$  Hz (pulse frequency)

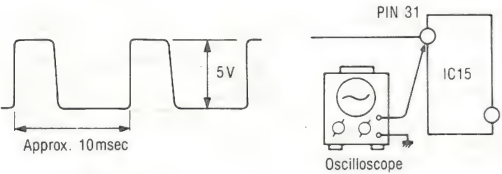


Fig. 21

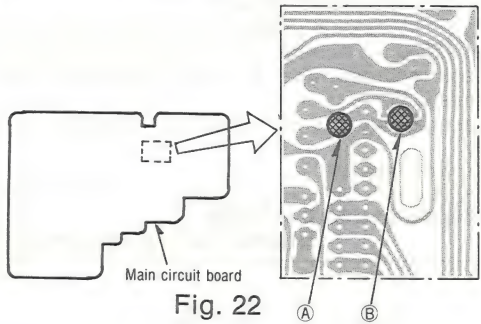


Fig. 22

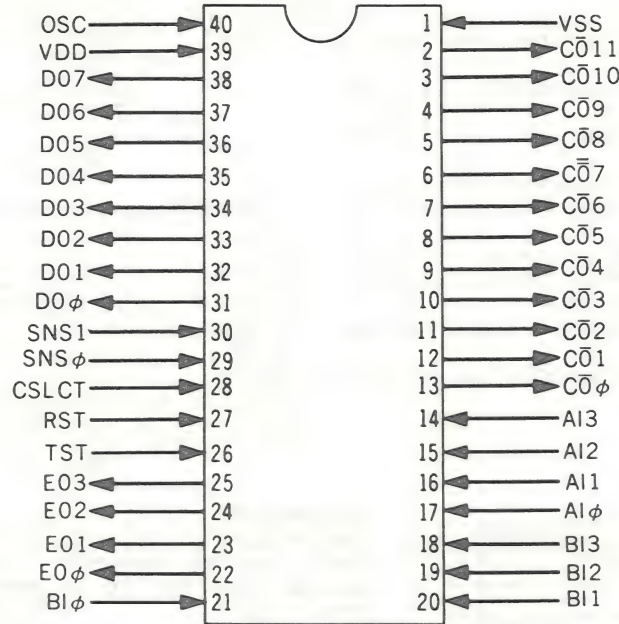
L

Level meter

Check that the LEVEL meter LED "0" is lit when  $0.4V \pm 1.5dB$  output appears at the LINE OUT terminal.


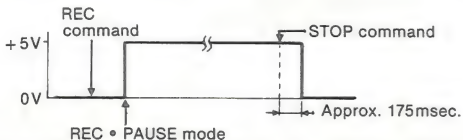
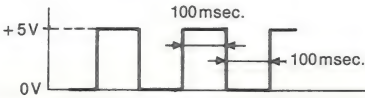
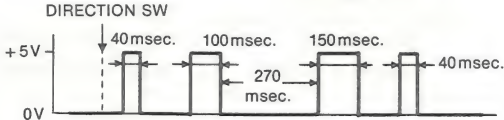
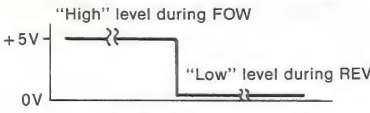
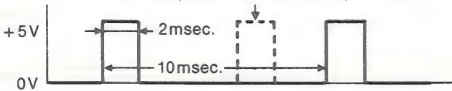
MICROCOMPUTER TERMINAL FUNCTION AND WAVEFORM

(BOTTOM VIEW)

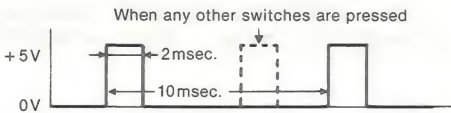

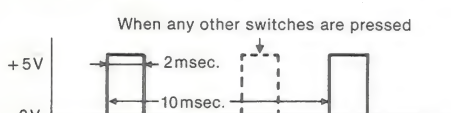
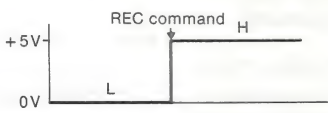
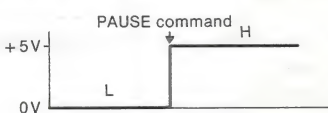
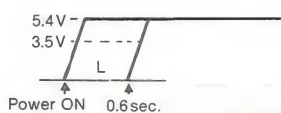
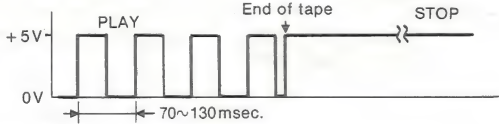


Terminal No.	Symbol	Name	Function/operation
1.	VSS	GND	
2.	CO11	Music select (M.S) command	• "High" level with music select at ON.
3.	CO10	Blank skip (B.S) command	• "High" level with blank skip at ON.
4.	CO9	Music repeat (M.R) command	• "High" level with music repeat at ON.
5.	CO8	REC MUTE	• "High" level pulse with REC MUTE button pressed during REC PLAY. <div></div>
6.	CO7	CUE/REVIEW MUTE	• "High" level pulse with CUE/REVIEW button pressed during PLAY. <div></div>
7.	CO6	Drive motor CCW rotation command	• "High" level pulse in each mode in operational sequence REV PLAY → PAUSE → STOP → FOW PLAY. • During switching between REV PLAY and FOW PLAY. <div></div>

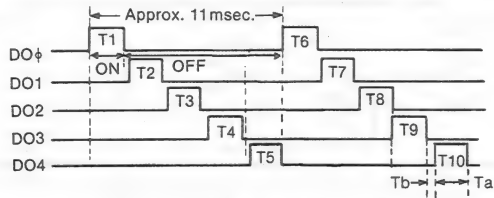
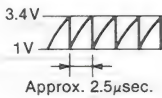


Terminal No.	Symbol	Name	Function/operation
8.	CO5	Drive motor CW rotation command	<ul style="list-style-type: none"> <li>• "High" level pulse in each mode in operational sequence FOW PLAY → PAUSE → STOP → REV PLAY.</li> </ul> 
9.	CO4	Muting for all amplifiers	<ul style="list-style-type: none"> <li>• "High" level during FF, REW and STOP.</li> <li>• "Low" level during REC, PLAY and CUE/REV.</li> </ul>
10.	CO3	Bias oscillation ON/OFF	<ul style="list-style-type: none"> <li>• Goes to "High" immediately after REC or PAUSE operation.</li> <li>• Remains in "High" during REC or PLAY operation.</li> <li>• Goes to "Low" approximately 175msec after the STOP command is given.</li> </ul> 
11.	CO2	FF/REW motor rotation select (FF/REW motor CCW rotation command)	<ul style="list-style-type: none"> <li>• "High" level during: <ul style="list-style-type: none"> <li>{ FOW PLAY</li> <li>{ FOW FF</li> <li>{ REV REW</li> </ul> </li> </ul>
12.	CO1	FF/REW motor rotation select (FF/REW motor CW rotation command)	<ul style="list-style-type: none"> <li>• "High" level during: <ul style="list-style-type: none"> <li>{ REV PLAY</li> <li>{ REV FF</li> <li>{ FOW REW</li> </ul> </li> </ul>
13.	COφ	FF and REW blinking-indication command	<ul style="list-style-type: none"> <li>• "High" level during FF and REW.</li> </ul> 
14.	AI3	Reading of input switch state CAM B (S606)	<ul style="list-style-type: none"> <li>• Input in switching-over from FOW PLAY to REV PLAY.</li> </ul> 
15.	AI2	Reading of input switch state CAM A (S605)	
16.	AI1	Connection to + B (bias)	
17.	AIφ	Reading of input switch state REC INH	<ul style="list-style-type: none"> <li>• "High" level when a tape not prepared with miserase prevention masking is loaded.</li> <li>• "Low" level with the cassette lid open.</li> </ul>
18.	BI3	Reading of input switch state DIR	<ul style="list-style-type: none"> <li>• Waveform when the cassette lid is closed with no tape loading.</li> </ul> 



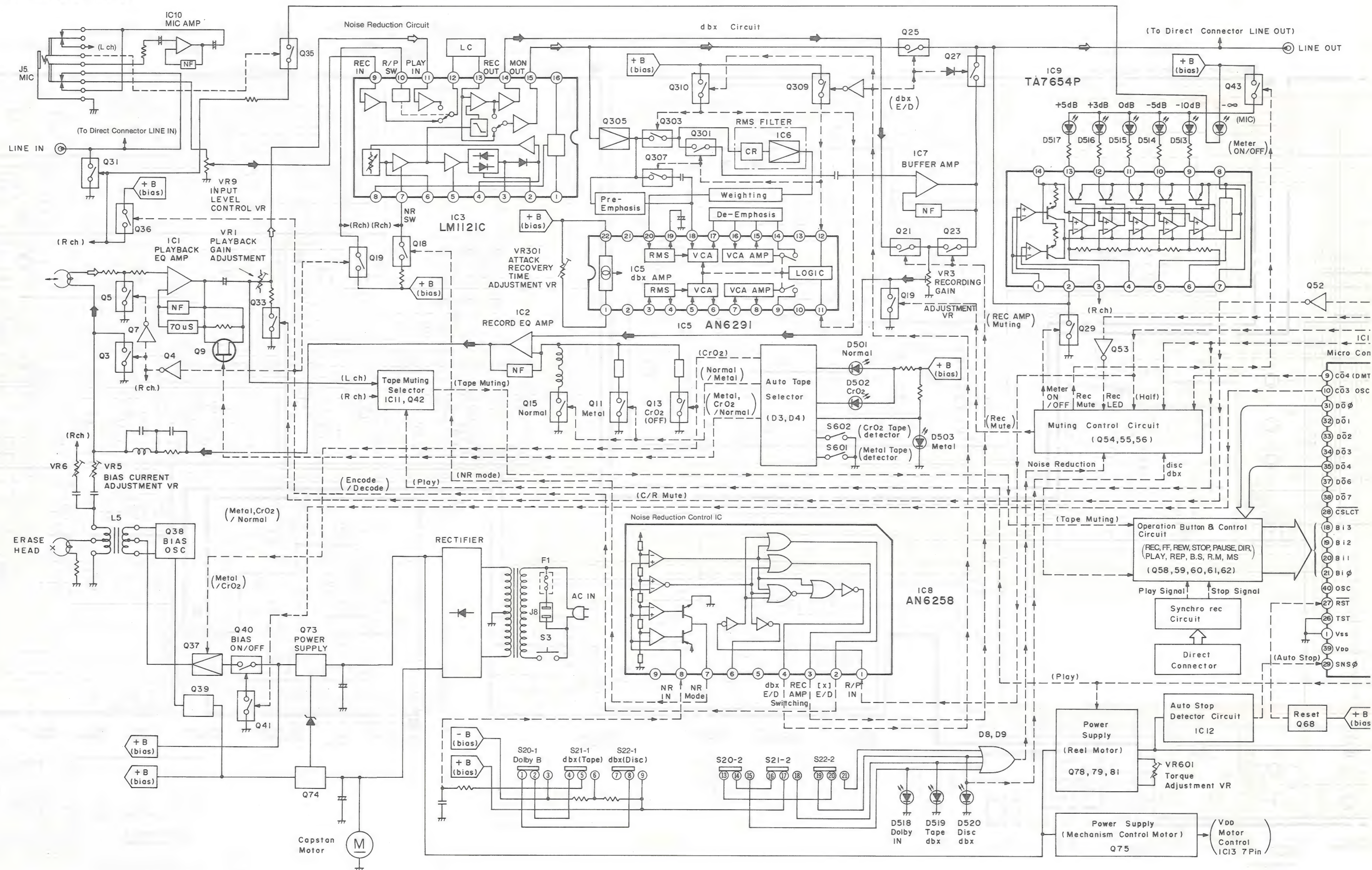
Terminal No.	Symbol	Name	Function/operation
19.	BI2	Reading of input switch state REC • PLAY	<ul style="list-style-type: none"> <li>Waveform when the cassette lid is closed with no tape loading.</li> </ul> 
20.	BI1	Reading of input switch state BS • PAUSE • FF	<ul style="list-style-type: none"> <li>Waveform when the cassette lid is closed with no tape loading.</li> </ul> 
21.	BIφ	Reading of input switch state BS • PAUSE • FF	<ul style="list-style-type: none"> <li>Waveform when the cassette lid is closed with no tape loading.</li> </ul> 
22.	EOφ	REC indication output	<ul style="list-style-type: none"> <li>"High" level concurrently with REC command.</li> <li>In TIMER REC mode, "High" level just after power on.</li> <li>In TIMER REC mode, "High" level remains unchanged even if the automatic stop reset mechanism operates with power on.</li> </ul> 
23.	EO1	PAUSE indication output	<ul style="list-style-type: none"> <li>"High" level concurrently with PAUSE command.</li> </ul> 
24.	EO2	Reel takeup torque selection and blank skip LED indication	<ul style="list-style-type: none"> <li>"High" level during PLAY.</li> <li>"Low" level during FF, REW and STOP.</li> </ul>
25.	EO3	DIRECTION indication output	<ul style="list-style-type: none"> <li>"Low" level during FORWARD.</li> <li>"High" level during REVERSE.</li> </ul>
26.	—	—	<ul style="list-style-type: none"> <li>Connection to GND.</li> </ul>
27.	RST	Reset terminal	<ul style="list-style-type: none"> <li>Terminal for reset signal to computer.</li> <li>Reset at "Low" level (less than 0.8 volts).</li> </ul> 
28.	CSLCT	—	<ul style="list-style-type: none"> <li>Non connection.</li> </ul>
29.	SNSφ	End-of-tape detection	



Terminal No.	Symbol	Name	Function/operation
30.			• Non connection.
31.	DO $\phi$	Input switch scanning	 <p>Pulse width: Ta = Approx. 2.0msec, Tb = Approx. 100μsec.</p>
32.	DO1		
33.	DO2		
34.	DO3		
35.	DO4		
36.	DO5		• Non connection.
37.	DO6		
38.	DO7		
39.	V <sub>DD</sub>	Power supply terminal	• Operative on 4.6 to 6.0 volts (typically 5.5 volts).
40.	OSC	Oscillation terminal	<ul style="list-style-type: none"> <li>• Generates oscillation at approximately 600kHz.</li> <li>• Because the connection of a probe affects the terminal, nothing should be connected to this terminal for any other measurements.</li> <li>• Use D<math>\phi</math> to 3 in measuring the computer's velocity; Approx. 125Hz in STOP condition.</li> </ul>  <p>Approx. 2.5μsec.</p>

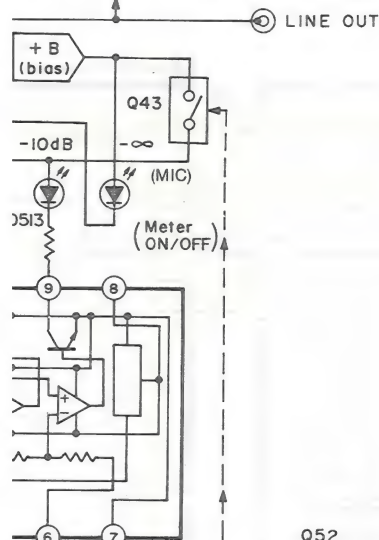


## BLOCK DIAGRAM





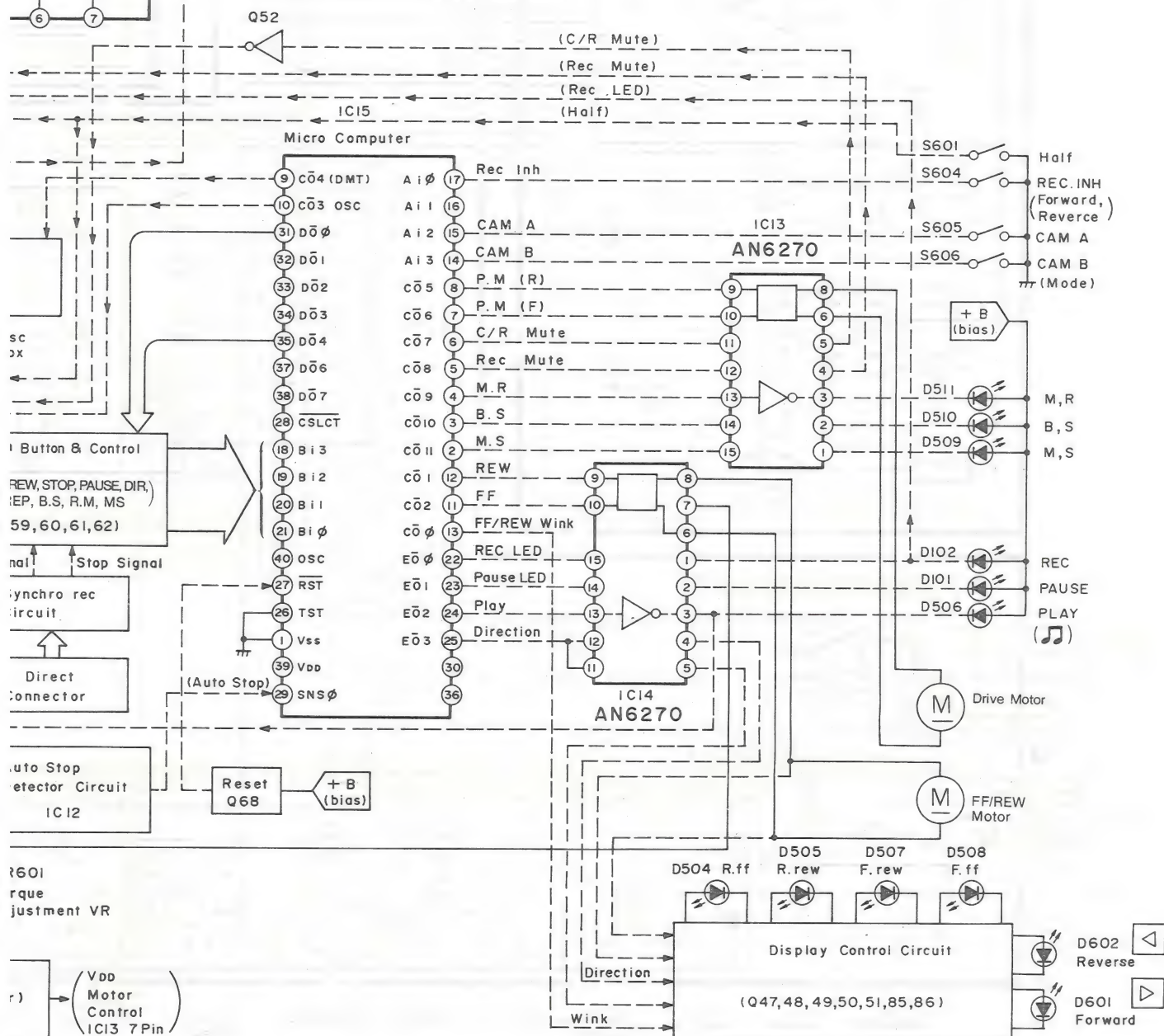
irect Connector LINE OUT)



# NOTES:

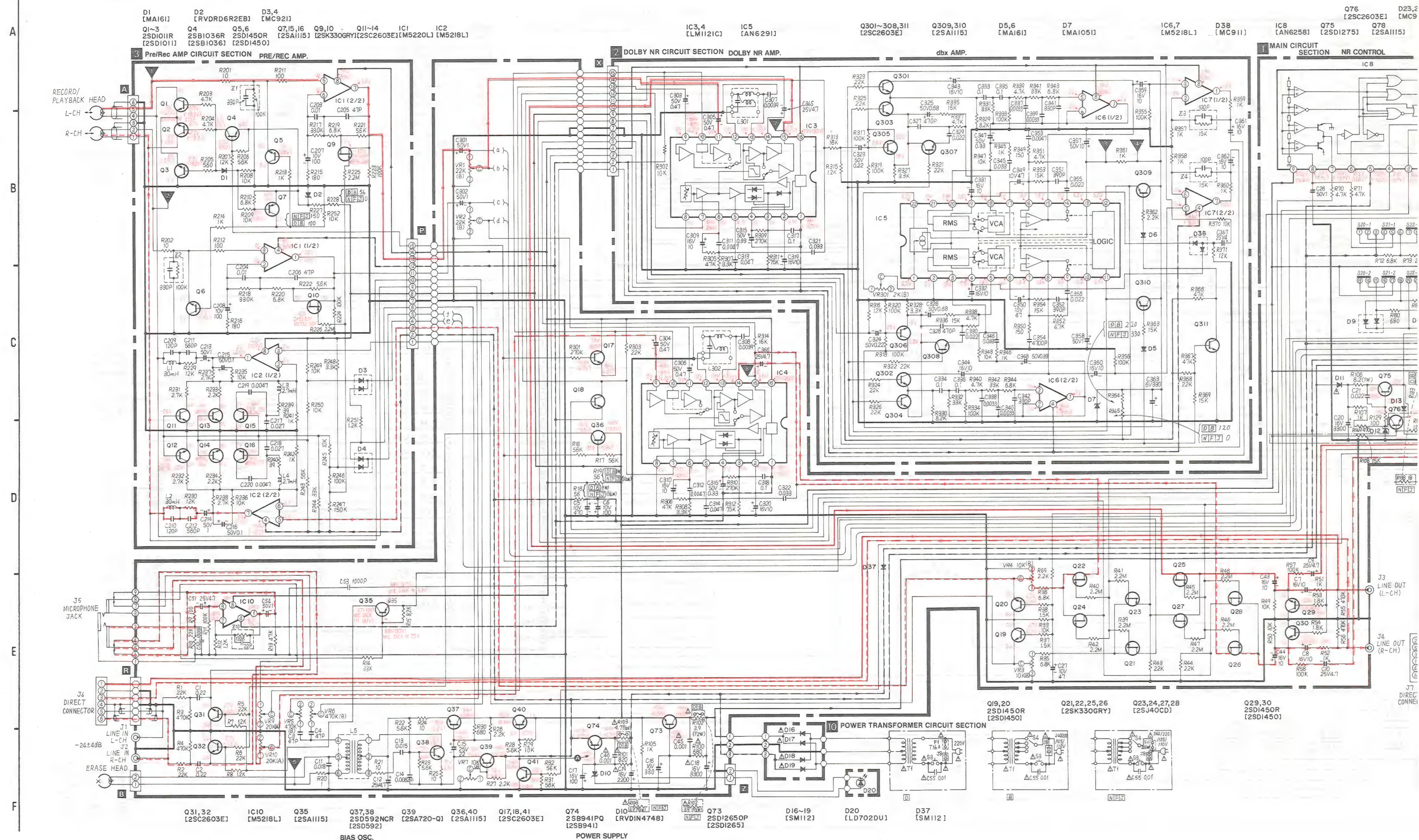
- S2 .....TIMER SWITCH
- S3 .....POWER ON/OFF SWITCH
- S5 .....REW SWITCH
- S6 .....FF SWITCH
- S7 .....RECORD SWITCH
- S8 .....DIRECTION SWITCH
- S9 .....STOP SWITCH
- S10 .....PAUSE SWITCH
- S11 .....PLAY SWITCH
- S12 .....MUSIC REPEAT SWITCH
- S13 .....BLANK SKIP SWITCH
- S14 .....REC MUTE SWITCH
- S15 .....MUSIC SELECT SWITCH
- S20 .....Dolby-B IN/OUT SWITCH (OUT)

- S21 .....dbx TAPE IN/OUT SWITCH (OUT)
- S22 .....dbx disc IN/OUT SWITCH (OUT)
- S601 .....AUTO TAPE SELECT SWITCH (Metal)
- S602 .....AUTO TAPE SELECT SWITCH (CrO<sub>2</sub>)
- S603 .....HALF SWITCH
- S604 .....REC INHIBIT SWITCH
- S605 .....CAM A SWITCH (Forward/Reverse Detection)
- S606 .....CAM B SWITCH (Mode Detection)
- ( → ) this arrow indicates the flow of the recording signal. (NR OUT).
- ( ⇨ ) this arrow indicates the flow of the playback signal. (NR OUT).
- ( ⇨ ) this arrow indicates the flow of the recording signal and playback signal combination.
- ( - - - - ) this arrow indicates the flow of the control signal.

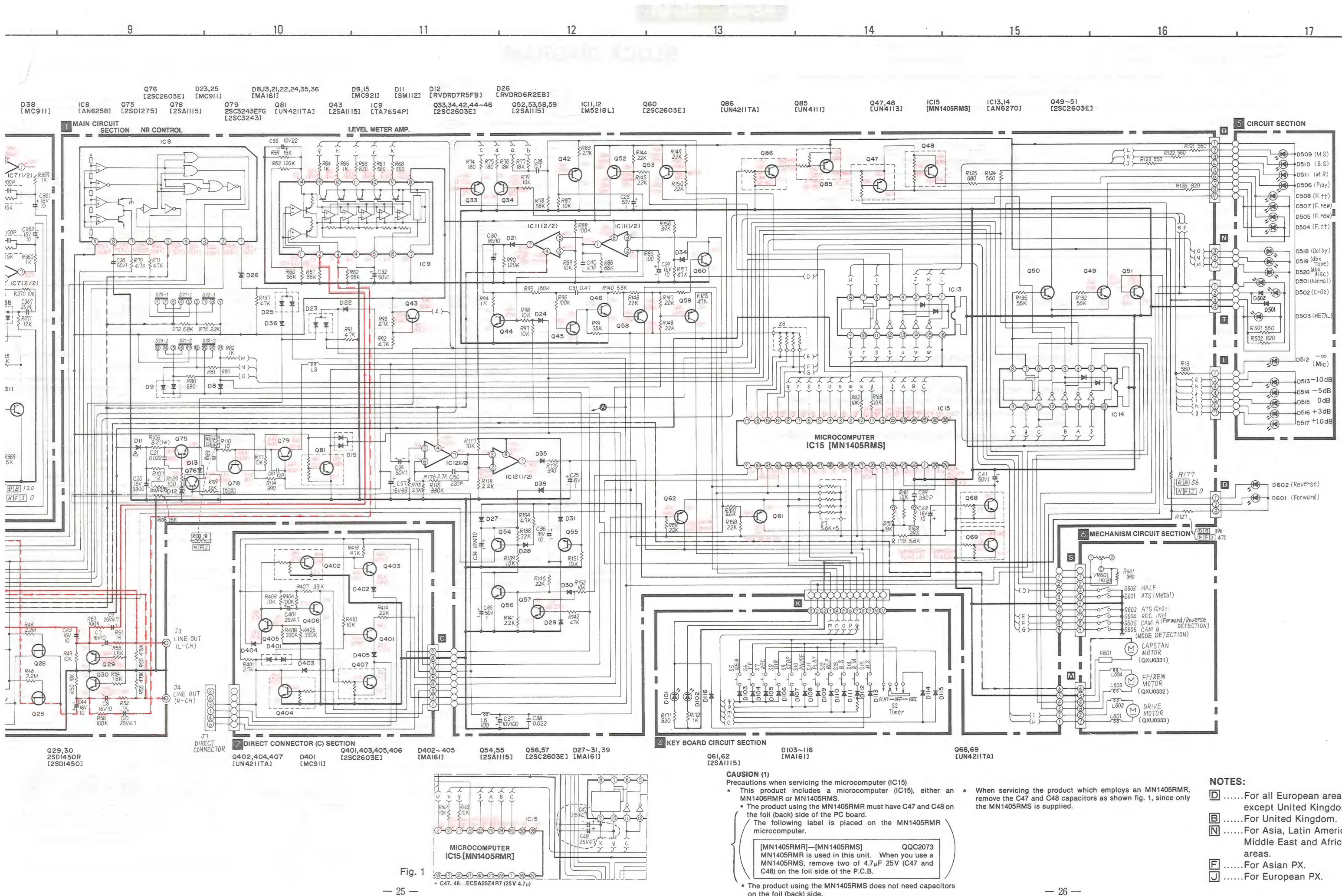




## SCHEMATIC DIAGRAM









## NOTES:

- S2 .....Timer switch (shown in 1 position).  
(1...TIMER REC, 2...OFF, 3...TIMER PLAY)
- S3 .....Power ON/OFF switch (shown in OFF position).
- S4 .....AC power voltage select switch.  
[B].....For United Kingdom.  
[N].....For Asia, Latin America, Middle East and Africa areas.  
[F].....For PX.
- S5 .....Rewind switch (shown in OFF position).
- S6 .....FF switch (shown in OFF position).
- S7 .....Record switch (shown in OFF position).
- S8 .....Direction switch (shown in OFF position).
- S9 .....Stop switch (shown in OFF position).
- S10 .....Pause switch (shown in OFF position).
- S11 .....Play switch (shown in OFF position).
- S12 .....Music repeat switch (shown in OFF position).
- S13 .....Blank skip switch (shown in OFF position).
- S14 .....REC Mute switch (shown in OFF position).
- S15 .....Music select switch (shown in OFF position).
- S20-1—S20-2...Dolby-B IN/OUT switch (shown in OUT position).
- S21-1—S21-2...dbx tape IN/OUT switch (shown in OUT position).
- S22-1—S22-2...dbx disc IN/OUT switch (shown in OUT position).
- S601 .....Auto tape select switch (for Metal tape).
- S602 .....Auto tape select switch (for CrO<sub>2</sub> tape).
- S603 .....Half switch (shown in OFF position).
- S604 .....REC inhibit switch (shown in OFF position).
- S605 .....Forward/Reverse detection switch (shown in OFF position).
- S606 .....Mode detection switch (shown in OFF position).
- VR1, 2.....Playback gain adjustment VR.
- VR3, 4.....Overall gain adjustment VR.
- VR5, 6.....Bias current adjustment VR.
- VR7 .....Erase current adjustment VR.
- VR9, 10 .....Input level controls.
- VR301 .....Attack recovery time adjustment VR.
- VR601 .....Takeup torque adjustment VR.
- Point (A), (B) ...Input scanning time adjustment points.
- L1, 2 .....Bias trap adjustment coil.
- L5 .....Bias Oscillation coil.
- L301, 302 .....MPX coil.
- Resistance are in ohms ( $\Omega$ ), 1/4 watt unless specified otherwise.  
1 K = 1,000( $\Omega$ ), 1 M = 1,000k( $\Omega$ ).
- Capacity are in micro-farads ( $\mu$ F) unless specified otherwise.
- The mark (▼) shows test point. e.g. ▼ = Test point 1.
- All voltage values shown in circuitry are under no signal condition and playback mode with volume control at minimum position otherwise specified.  
( ) .....Voltage values at record mode.  
Tape .....Voltage values at dbx tape mode.  
disc .....Voltage values at dbx disc mode.  
CrO<sub>2</sub> .....Voltage values at CrO<sub>2</sub> tape mode.  
Metal .....Voltage values at Metal tape mode.  
Stop .....Voltage values at Stop mode.  
CUE/REV .....Voltage values at CUE/REV mode.  
FF/REW .....Voltage values at FF/REW mode.  
REC MUTE.....Voltage values at REC MUTE mode.  
Dolby .....Voltage values at Dolby NR mode.  
MS .....Voltage values at music select mode.  
BS .....Voltage values at blank skip mode.  
MR .....Voltage values at music repeat mode.  
For measurement use VTVM.
- ( ) indicates B+ (bias).
- ( ) indicates B- (bias).
- ( ) indicates the flow of the playback signal. (NR out).
- ( ) indicates the flow of the recording signal. (NR out).
- Important safety notice  
Components identified by  $\Delta$  mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
- Described in the schematic diagram are two types of numbers; the supply parts numbers and production parts number for transistors and diodes. One type of number is used for supply parts number and production parts number when they are identical.  
e.g. Q1  
2SC1844(E,F)——Production parts number  
[2SC1844E]——Supply parts number  
D212  
1S2473T77——Production parts number  
[MA161]——Supply parts numbers
- The supply parts number is described alone in the replacement parts list.

• This schematic diagram may be modified at any time with the development of new technology.

## IC13

	Playback mode	Record mode	
1	8.6V	8.8V	MS SW ON 0V
2	8.6V	8.8V	BS SW ON 0V
3	8.6V	8.8V	MR SW ON 0V
4	10.1V	10.3V	REC MUTE 0V
5	10.1V	10.3V	CUE/REV 0V
6	0V	0V	
7	6.5V	6.5V	
8	0V	0V	
9	0V	0V	
10	0V	0V	
11	0V	0V	CUE/REV 4.5V
12	0V	0V	REC MUTE 4.5V
13	0V	0V	MR SW ON 4.6V
14	0V	0V	BS SW ON 4.5V
15	0V	0V	MS SW ON 4.5V
16	13.6V	13.9V	

## IC14

	Playback mode	Record mode	
1	8.6V	0.1V	Stop 8.9V
2	8.7V	0.1V	Pause 0.1V
3	0.2V	10.1V	Stop 10.2V
4	3.3V Reverse 0.1V	3.3V	
5	0.4V Reverse 0V	0.3V	
6	5.5V	0V	FF/REW 9.6V CUE/REV 9.6V
7	5.5V	10.0V	Stop 10.1V
8	0.1V	0V	FF/REW 9.5V CUE/REV 9.5V
9	0.1V Reverse 4.6V	0V	FF/REW 4.6V
10	4.6V	0V	
11	0.1V Reverse 4.6V	0.1V	
12	0.1V Reverse 4.6V	0.1V	
13	4.6V	0.1V	Stop 0.1V
14	0.1V	4.6V	Pause 4.6V
15	0.1V	4.6V	Stop 0.1V
16	13.6V	13.9V	

## SPECIFICATIONS \* Input level controls...MAX

Playback S/N ratio * Test tape...QZZCFM	Greater than 45dB
Overall distortion * Test tape ...QZZCRA for Normal ...QZZCRX for CrO <sub>2</sub> ...QZZCRZ for Metal	Less than 4%
Overall S/N ratio * Test tape...QZZCRA	Greater than 43dB (without NAB filter)

## Q301

	Playback mode	Record mode	
B	1.9V DISC 0.5V	1.9V	
C	1.3V DISC 1.2V	1.3V	
E	1.3V DISC 1.9V	1.3V	

## Q302

	Playback mode	Record mode	
B	1.9V DISC 0.1V	1.9V	
C	1.3V DISC 1.3V	1.3V	
E	1.3V DISC 1.9V	1.3V	

## Q303

	Playback mode	Record mode	
B	0.4V DISC 2.5V	0.4V	
C	1.3V DISC 1.9V	1.3V	
E	1.9V DISC 1.9V	1.9V	

## Q304

	Playback mode	Record mode	
B	0.4V DISC 2.5V	0.4V	
C	1.3V DISC 1.9V	1.3V	
E	1.9V DISC 1.9V	1.9V	

## Q307

	Playback mode	Record mode	
B	2.6V DISC 0.5V	2.6V	
C	1.9V DISC 1.9V	1.9V	
E	1.9V DISC 1.0V	1.9V	

## Q308

	Playback mode	Record mode	
B	2.5V DISC 0.5V	2.5V	
C	1.9V DISC 1.9V	1.9V	
E	1.9V DISC 1.0V	1.9V	

## Q309

	Playback mode	Record mode	
B	4.5V DISC 4.8V	4.5V	
C	5.2V DISC 5.2V	5.2V	
E	5.2V DISC 0.5V	5.2V	

## Q310

	Playback mode	Record mode	
B	4.7V DISC 4.5V	4.8V	
C	5.2V DISC 5.2V	5.2V	
E	0.4V DISC 5.2V	0.4V	

## Q311

	Playback mode	Record mode	
B	0.7V DISC -2.4V	0.7V	
C	0.1V DISC 10.1V	0.1V	
E	0V DISC 0V	0V	

## Q50

	Playback mode	Record mode	
B	0.1V Reverse 0.6V	0V	
C	0.5V Reverse 0V	0.5V	
E	0V Reverse 0V	0V	

## Q18

	Playback mode	Record mode	
B	-10.9V Dolby -7.6V	-10.7V Dolby -7.3V	
C	-3.0V Dolby -8.3V	-2.8V Dolby -8.0V	
E	-8.6V Dolby -8.3V	-8.2V Dolby -8.0V	

## Q21

	Playback mode	Record mode	
D	0.1V Tape 0.1V	0.1V Tape 0V	
G	0.6V Tape -9.0V	0.7V Tape -8.8V	
S	0.1V Tape 0V	0.1V Tape 0V	

## Q22

	Playback mode	Record mode	
D	0.1V Tape 0V	0.1V Tape 0V	
G	0.6V Tape -8.8V	0.7V Tape -8.8V	
S	0.1V Tape 0V	0.1V Tape 0V	

## Q23

	Playback mode	Record mode	
D	0V Tape 0V	0V Tape 0V	
G	8.4V Tape -0.5V	8.5V Tape -0.5V	
S	0.1V Tape 0V	0.1V Tape 0V	

## Q24

	Playback mode	Record mode	
D	0V Tape 0V	0V Tape 0V	
G	8.4V Tape -0.5V	8.4V Tape -0.5V	
S	0.1V Tape 0V	0.1V Tape 0V	

## Q25

	Playback mode	Record mode	
D	0V Tape 0V	0.1V Tape 0V	
G	0.5V Tape -8.9V	0.7V Tape -8.9V	
S	0V Tape 0.1V	0.1V Tape 0.1V	

## Q26

	Playback mode	Record mode	
D	0V Tape 0V	0.1V Tape 0V	
G	0.5V Tape -8.9V	0.7V Tape -8.9V	
S	0V Tape 0.1V	0.1V Tape 0.1V	

## Q27

	Playback mode	Record mode	
D	0V Tape 0V	0V Tape 0V	
G	8.1V Tape -0.5V	8.3V Tape -0.5V	
S	0V Tape 0V	0.1V Tape 0V	

## Q28

	Playback mode	Record mode	
D	0V Tape 0V	0V Tape 0V	
G	8.1V Tape -0.5V	8.3V Tape -0.5V	
S	0V Tape 0V	0.1V Tape 0V	

## Q54

	Playback mode	Record mode	Stop
B	9.9V DISC 10.2V	10.1V DISC 10.2V	9.0V
C	0.3V DISC -0.1V	-0.2V DISC -0.1V	9.7V
E	10.0V DISC 10.2V	10.2V DISC 10.2V	9.8V

## Q56

	Playback mode	Record mode	Stop
B	0V DISC 0V	0V DISC 0V	0.7V
C	9.9V DISC 10.2V	10.1V DISC 10.2V	0V
E	0V	0V	


## Q55

	Playback mode	Record mode	Stop
B	10.3V Tape 9.9V	10.5V Tape 9.9V	
C	0V Tape 0.7V	0V Tape 0.7V	
E	10.0V	10.2V	10.3V



## ELECTRICAL PARTS LIST

## REPLACEMENT PARTS LIST

**Important safety notice**  
Components identified by  mark have special characteristics important for safety.  
When replacing any of these components, use only manufacturer's specified parts.

NOTES: RESISTORS

ERD.....Carbon  
ERG.....Metal-oxide  
ERS.....Metal-oxide  
ERO.....Metal-film  
ERX.....Metal-film  
ERQ.....Fuse type metallic  
ERC.....Solid  
ERF.....Cement

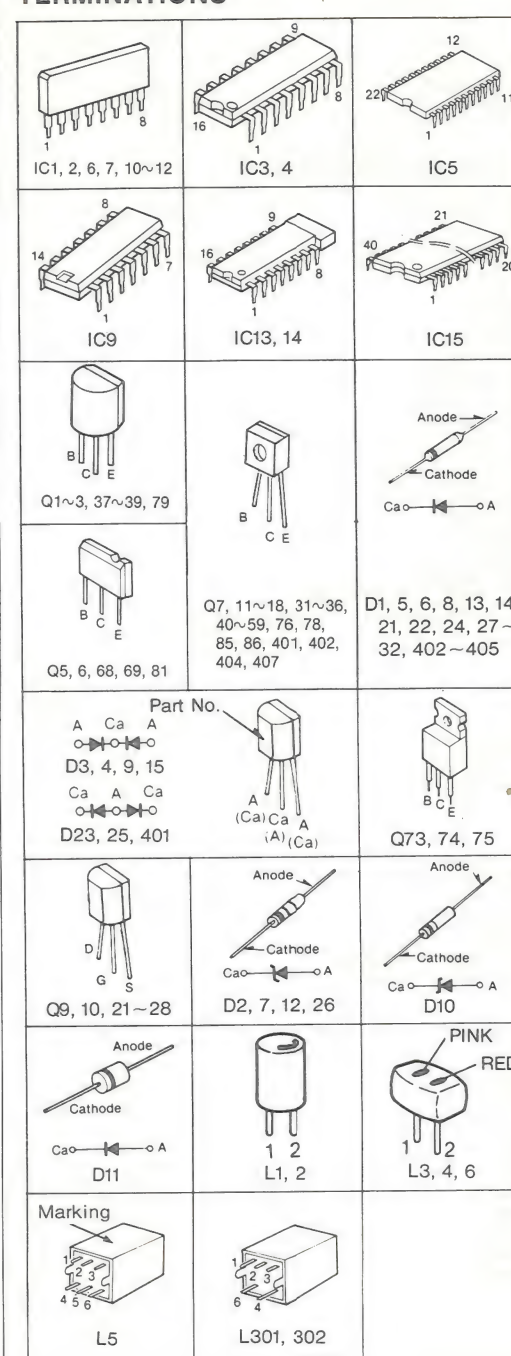
## CAPACITORS

ECBA .....	Ceramic	ECE□ .....	Electrolytic
ECG□ .....	Ceramic	ECE□N .....	Non polar electrolytic
ECK□ .....	Ceramic	EQCS .....	Polystyrene
ECC□ .....	Ceramic	ECS□ .....	Tantalum
ECF□ .....	Ceramic	QCS .....	Tantalum
ECQM .....	Polyester film		
ECQE .....	Polyester film		
ECQF .....	Polypropylene		

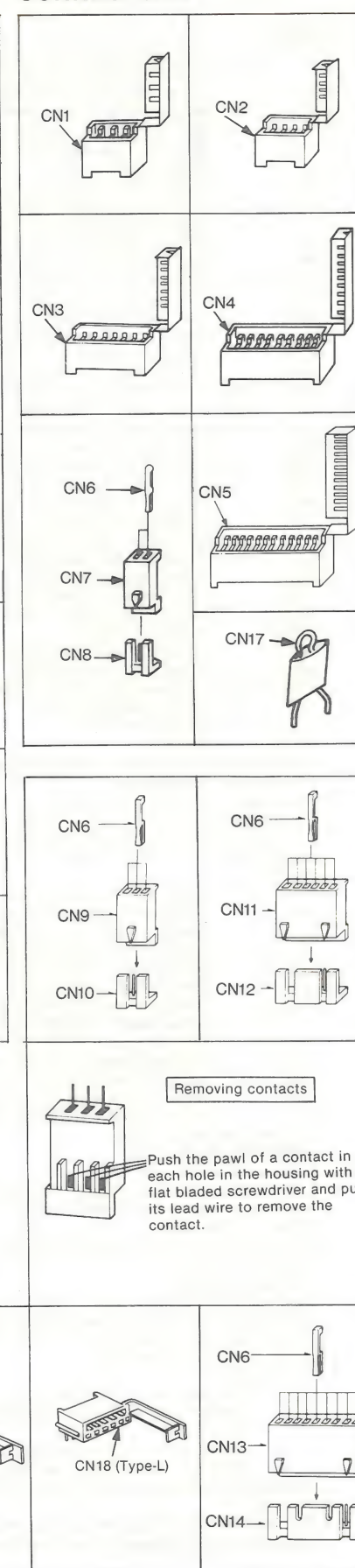
Ref. No.	Part No.	Ref. No.	Part No.	Ref. No.	Part No.	Ref. No.	Part No.	Ref. No.	Part No.	Ref. No.	Part No.
RESISTORS		R 94	ERD25FJ102	R 171	ERD25FJ821	R 362	ERD25FJ222	C 207, 208	ECEA1AS101	Q 43	2SA1115
R 1, 2	ERD25TJ223	R 95	ERD25FJ184	R 172	ERD25FJ102	R 363	ERD25TJ153	C 209, 210	ECKD2H121KB	Q 44, 45, 46	2SC2603E
R 3, 4	ERD25TJ474	R 96	ERD25TJ104	R 173, 174	ERD25FJ562	R 364	ERD25FJ331	C 211, 212	ECKD1H561KB	Q 47, 48	UN4113
R 5, 6	ERD25TJ223	R 97, 98	ERD25FJ103	R 175	ERD25FJ391	R 366, 367	ERD25TJ473	C 213, 214	ECEA50Z1	Q 49, 50, 51	2SC2603E
R 7, 8	ERD25FJ122	R 99	ERD25TJ563	R 201, 202	ERD25FJ100	R 368	ERD25TJ223	C 215, 216	ECEA1HS0R1	Q 52, 53, 54, 55	2SA1115
R 9	ERD25FJ101	R 100	ERD25FJ681	R 203, 204	ERD25FJ472	R 369	ERD25TJ153	C 217, 218	ECQV1H273JZ	Q 56, 57	2SC2603E
R 10	ERD25TJ223	R 101	ERD25FJ821	R 205	ERD25FJ561	R 370	ERD25TJ103	C 219, 220	ECFDD472KVY	Q 58, 59	2SA1115
R 11	ERD25TJ104	R 102	[DB] Δ ERQ12HJ3R9	R 206	ERD25TJ563	R 371	ERD25TJ123	C 301, 302	ECEA50Z1	Q 60	2SC2603E
R 12	ERD25FJ122		[For all European areas.]	R 207	ERD25TJ123	R 401	ERD25FJ272	C 303, 304, 305, 306		Q 61, 62	2SA1115
R 13	ERD25TJ473		[NFJ] Δ ERX12ANJ3R9	R 208, 209	ERD25FJ103	R 403	ERD25FJ103		ECEA50ZR47	Q 68, 69	UN4211TA
R 13	ERD25FJ561		[For PX. For Asia, Latin America, Middle East and Africa areas.]	R 210	ERD25FJ682	R 404	ERD25TJ104	C 307, 308	ECFDD392KVY	Q 73	2SD1265
R 14	ERD25TJ333			R 211, 212	ERD25FJ101	R 405	ERD25TJ334	C 309, 310	ECEA1HS100	Q 74	2SB941
R 15	ERD25FJ822	R 103	[DB] Δ ERD2FCJ4R7	R 213, 214	ERD25FJ102	R 407	ERD25TJ333	C 311, 312	ECQV1H472JZ	Q 75	2SD1275
R 16, 17	ERD25TJ563		[For all European areas.]	R 215, 216	ERD25FJ184	R 408	ERD25TJ334	C 313, 314	ECQV1H473JZ	Q 76 [DB]	2SC2603E
R 18 [DB]	ERG1ANJ560		[For all European areas.]	R 217, 218	ERD25TJ331	R 410	ERD25FJ103	C 315, 316	ECEA50MR33R		[For all European areas.]
	[For all European areas.]		[NFJ] Δ ERD25FJ3R9	R 219, 220	ERD25FJ682	R 413	ERD25TJ473	C 317, 318	ECQV1H104JZ	Q 78	2SA1115
	[NFJ] ERD25FJ560		[For PX. For Asia, Latin America, Middle East and Africa areas.]	R 221, 222	ERD25FJ562	R 414	ERD25TJ223	C 319, 320	ECEA1HS100	Q 79	2SC2603E
	[For PX. For Asia, Latin America, Middle East and Africa areas.]	R 105	ERD25FJ102	R 223, 224	ERD25TJ104					Q 81	UN4211TA
R 19 [DB]	ERG1ANJ560		[For all European areas.]	R 225, 226	ERD25TJ225					Q 85	UN4111
	[For all European areas.]		[NFJ] ERD25FJ151	R 227 [DB]	ERD25FJ101					Q 86	UN4211TA
	[NFJ] ERD25FJ560		[For PX. For Asia, Latin America, Middle East and Africa areas.]	R 106	ERX1ANJ8R2					Q 301, 302, 303, 304, 305, 306	2SC2603E
	[For PX. For Asia, Latin America, Middle East and Africa areas.]	R 107	ERD25FJ102	R 108 [DB]	ERD25TJ153					Q 309, 310	2SA1115
R 20	ERD25FJ1R0		[For all European areas.]	R 109 [DB]	ERD25TJ123					Q 311, 401	2SC2603E
R 21	ERD25FJ100	R 110	ERD25FJ100							Q 402	UN4211TA
R 22, 23	ERD25FJ562	R 111	ERD25FJ103	R 110	ERD25FJ100					Q 403	2SC2603E
R 24, 25	ERD25FJ100	R 114	ERD25FJ391	R 111	ERD25FJ103					Q 404	UN4211TA
R 26, 27	ERD25FJ222	R 115	ERD25FJ101	R 114	ERD25FJ391					Q 405, 406	2SC2603E
		R 116	ERD25TJ334	R 115	ERD25FJ101					Q 407	UN4211TA
R 28	ERD25FJ562	R 116	ERD25TJ334	R 117	ERD25FJ103						
R 29	ERD25FJ103	R 117	ERD25FJ103	R 118	ERD25FJ332						
R 30	ERD25FJ681	R 118	ERD25FJ332	R 121, 122, 123, 124							
R 31, 32	ERD25TJ563	R 121, 122, 123, 124		R 125	ERD25FJ681						
R 33	ERD25FJ103	R 125	ERD25FJ681	R 126	ERD25FJ821						
R 35, 36	ERD25FJ682	R 126	ERD25FJ821	R 127 [DB]	ERD25FJ391						
R 37, 38	ERD25FJ152	R 127 [DB]	[For all European areas.]		[NFJ] ERD25FJ471						
R 39, 40, 41, 42			[For all European areas.]		[For PX. For Asia, Latin America, Middle East and Africa areas.]						
	ERD25TJ225		[NFJ] ERD25FJ471								
R 43, 44	ERD25TJ223		[For PX. For Asia, Latin America, Middle East and Africa areas.]								
R 45, 46, 47, 48	ERD25TJ225										
R 49, 50	ERD25FJ103	R 128	ERD25TJ473								
R 51, 52	ERD25FJ102	R 129	ERD25FJ101								
R 53, 54	ERD25FJ182	R 132	ERD25TJ563								
R 55, 56	ERD25TJ474	R 133 [DB]	ERQ14AJ180								
R 57, 58	ERD25TJ104		[For all European areas.]								
R 59	ERD25TJ153		[NFJ] ERD25FJ180								
R 60, 61, 62			[For PX. For Asia, Latin America, Middle East and Africa areas.]								
	ERD25TJ563										
R 63	ERD25TJ124	R 135, 136	ERD25TJ563								
R 64, 65	ERD25FJ102										
R 66	ERD25FJ821										
R 67, 68	ERD25FJ561	R 137	ERD25FJ472								
R 69	ERD25FJ222	R 138	ERD25TJ223								
R 70, 71	ERD25FJ472	R 139	ERD25FJ103								
R 72	ERD25FJ682	R 140	ERD25FJ562								
R 73	ERD25FJ222	R 141	ERD25TJ223								
R 74, 75	ERD25FJ181	R 142	ERD25TJ473								
R 76, 77	ERD25TJ183	R 143	ERD25FJ562								
R 78	ERD25TJ683	R 144, 145, 146, 147, 148, 149, 150									
R 79	ERD25FJ103	R 151, 152	ERD25FJ103								
R 80	ERD25FJ681	R 153	ERD25TJ104								
R 81, 82	ERD25FJ102	R 154	ERD25FJ472								
R 83	ERD25FJ272	R 155	ERD25TJ183								
R 85	ERD25FJ101	R 156	ERD25TJ393								
R 86	ERD25TJ683	R 157	ERD25TJ473								
R 87	ERD25FJ103	R 158, 159	ERD25TJ223								
R 88	ERD25TJ104	R 160	ERD25FJ562								
R 89	ERD25FJ103	R 161, 162, 163									
R 90	ERD25TJ124										
R 91, 92	ERD25FJ472	R 168	ERD25TJ393								
R 93	ERD25FJ272	R 170 [DB]	ERQ14AJ560								
			[For all European areas.]								

Ref. No.	Part No.	Part Name & Description
<b>COILS</b>		
L 1, 2	QLQX0343KWA	Trap Coil
L 3, 4	QLQX2722D	Coil
L 5	QLB0198	Bias Oscillation Coil
L 6	QLQX1012DT	Choke Coil
L 8	ELEH101KA	Coil
L 301, 302		
	QLM9Z9K	MPX Coil
L 601, 602, 603, 604		
	ELEH101KA	Coil
<b>TRANSFORMERS</b>		
T 1 [D] △	QLPD80ELC	Power Transformer
[For all European areas except United Kingdom.]		
[BNFJ] △	QLPA73ELC	Power Transformer
[For PX. For United Kingdom, Asia, Latin America		
Middle East and Africa areas.]		
<b>FUSES</b>		
F 1 [D] △	XBAQ0010	Fuse (T 1.6A)
[For all European areas except United Kingdom.]		
[NFJ] △	XBA2E02NS5	Fuse (200mA)
[For PX. For Asia, Latin America, Middle East and		
Africa areas.]		
F 601	QRUF10WH	I.C PROTECTOR
<b>SWITCHES</b>		
S 2	QSS1305	Slide Switch (Timer)
S 3	△ QSW1127	Push Switch (Power
		ON/OFF)
S 4		
[BNFJ] △	QSR1407H	Rotary Switch (AC Power
		Voltage Selector)
[For PX. For United Kingdom, Asia, Latin America,		
Middle East and Africa areas.]		
S 5, 6	SSG13	Key Board Switch
		(F.F/REW)
S 7	QSW1124	Key Board Switch with
		D102 (Record)
S 8, 9	SSG13	Key Board Switch
		(Direction/Stop)
S 10	QSW1126	Key Board Switch with
		D101 (Pause)
S 11, 12, 13, 14, 15		
	SSG13	Key Board Switch-
		(Play/Music Repeat/
		Blank Skip/Rec
		Mute/Music Select)
S 20, 21, 22		
	QSWX415	Push Switch (NR Selecto
S 601, 602, 603, 604		
	QSB0296	Leaf Switch
		(Metal tape/CrO <sub>2</sub>
		tape/Half/Rec Inhibit)
S 605, 606		
	QSB0295	Leaf Switch
		(Forward•Reverse
		Detection/Mode)
<b>JACKS</b>		
J 1, 2, 3, 4		
	QEJ5030C	Jack Board (LINE IN/OUT
J 5	QJA0262	Microphone Jack
J 6, 7	SJS9607	Direct Connector
J 8		
[DNFJ] △	SJS9225	AC Outlet
[For PX. For all European areas except United		
Kingdom, Asia, Latin America, Middle East and		
Africa areas.]		
[B] △	SJS9227	AC Outlet
[For United Kingdom.]		
<b>CONNECTORS</b>		
CN 1	QJS1997S	Jumper Socket (3 Pin)
CN 2	QJS1987S	Jumper Socket (4 Pin)
CN 3	QJS1962S	Jumper Socket (7 Pin)
CN 4	QJS1988S	Jumper Socket (9 Pin)
CN 5	QJS1990S	Jumper Socket (12 Pin)
CN 6	QJT1054	Contact
CN 7	QJS1920TN	2 Pin Socket
CN 8	QJP1920TN	2 Pin Post
CN 9	QJS1921TN	3 Pin Socket
CN 10	QJP1921TN	3 Pin Post
CN 11	QJS1922TN	6 Pin Socket
CN 12	QJP1922TN	6 Pin Post
CN 13	QJS1923TN	9 Pin Socket
CN 14	QJP1923TN	9 Pin Post
CN 15	QJS1925TNL	15 Pin Socket
CN 16	QJP1925TN	15 Pin Post
CN 17	QJT1090	Check Pin
CN 18	QJS2000S	Jumper Socket (6 Pin,
		Type-L)
CN 19	QJS2001S	Jumper Socket (9 Pin,
		Type-L)

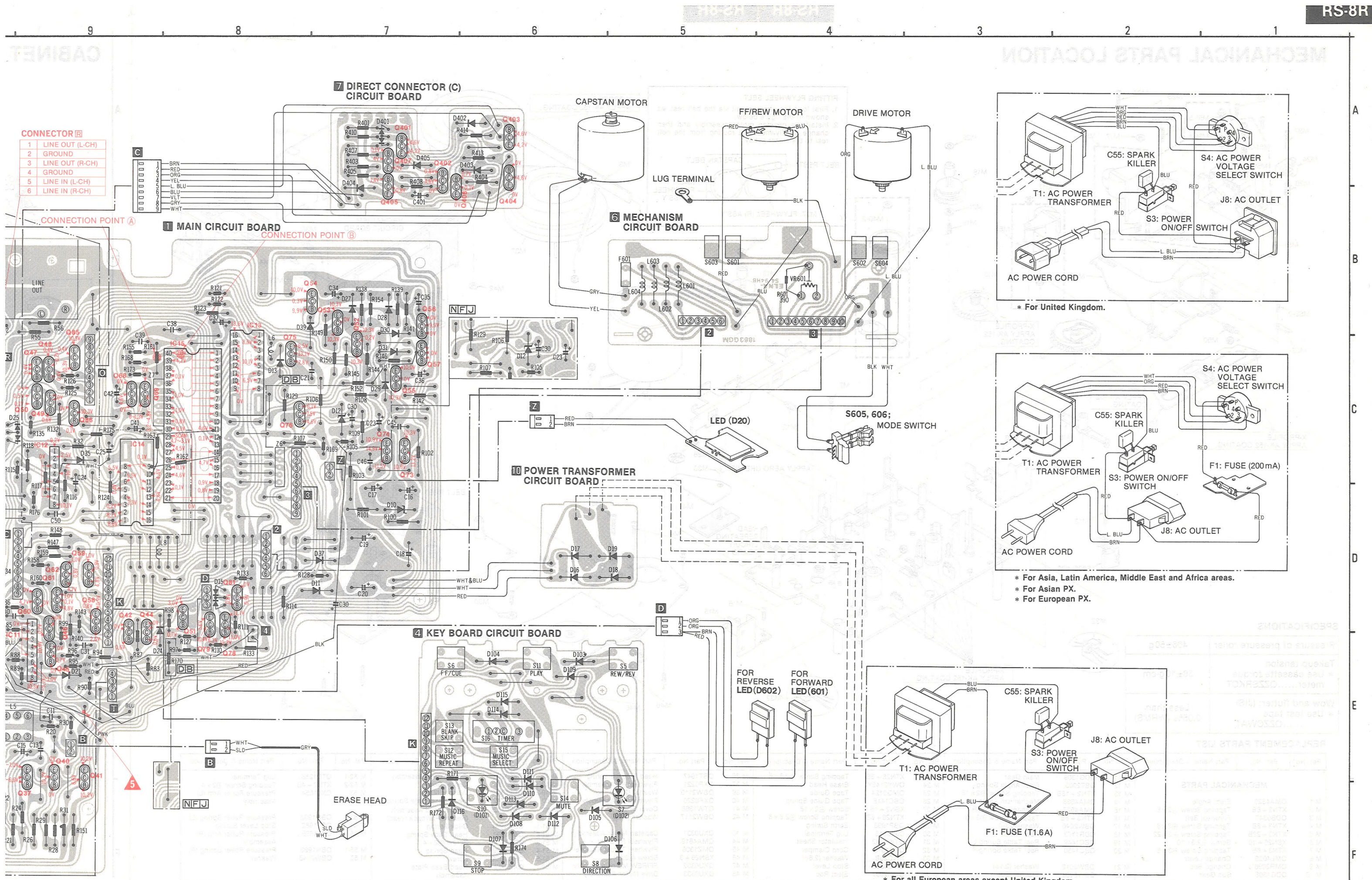
## TERMINATIONS



## CONNECTORS



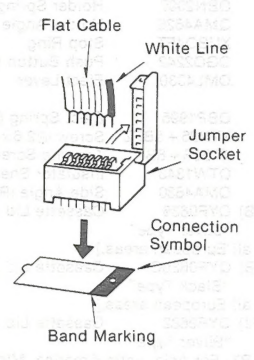




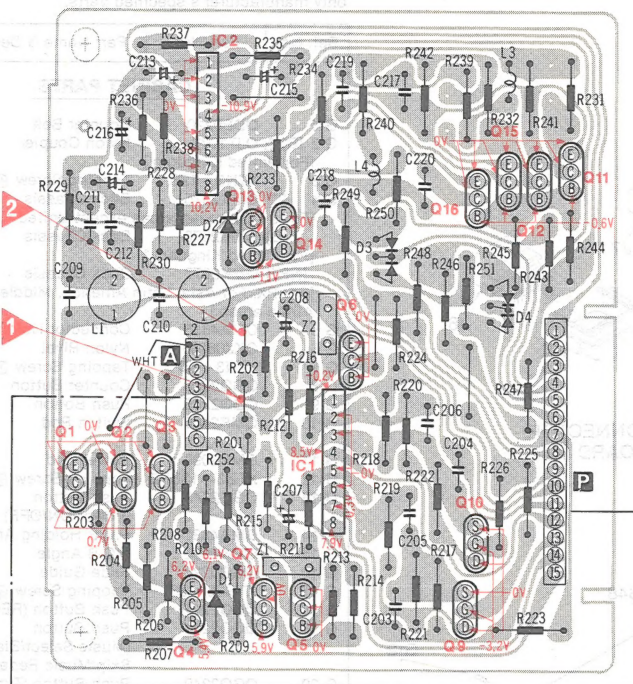


## CONNECTION OF A FLAT CABLE

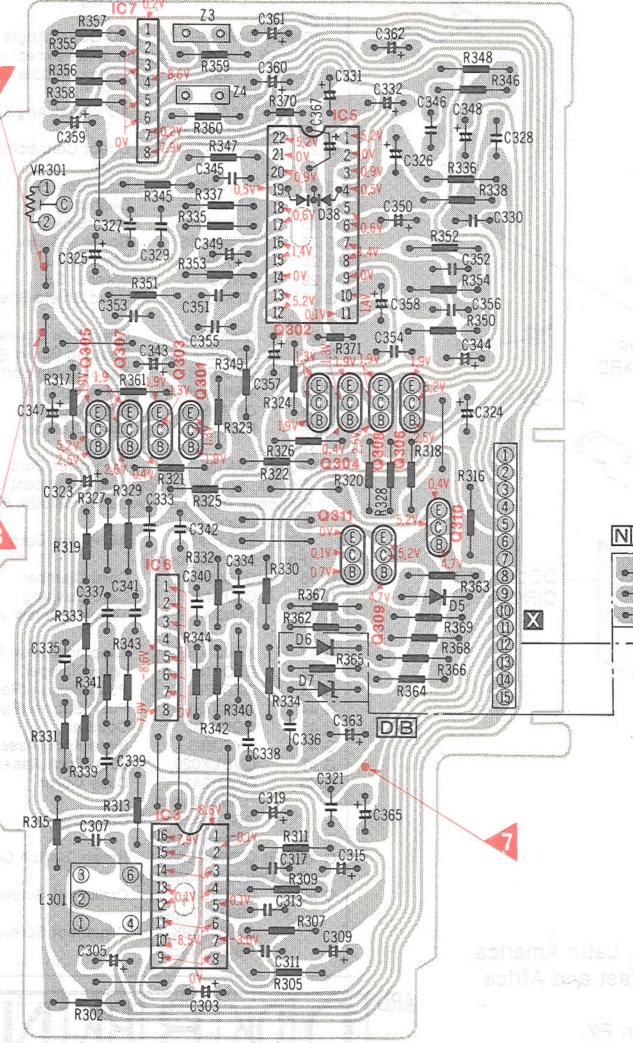
Connect the flat cable to the jumper socket so that the white line on the flat cable corresponds to the band mark side of the connection symbol (yellow or white symbol on the PC board) for the jumper socket. (This connection may differ from those for conventional models.)



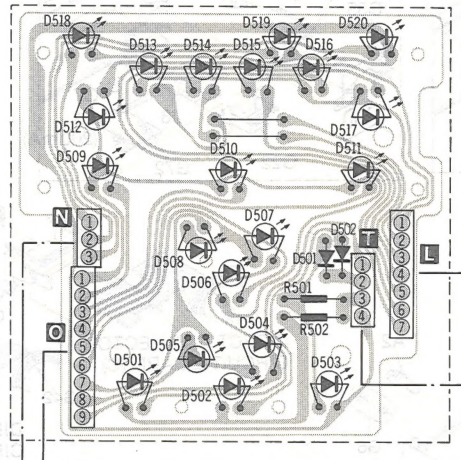
## 3 Pre/Rec AMPLIFIER CIRCUIT BOARD



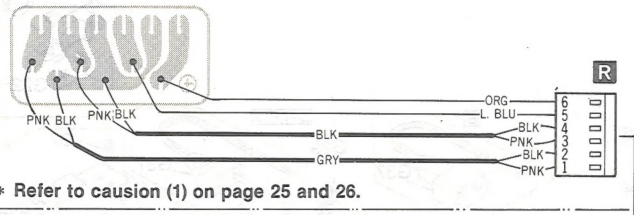
## 2 DOLBY NR CIRCUIT BOARD



## 5 LED BLOCK ASSY (The part that must be replaced will be supplied as part of an LED block assembly.)



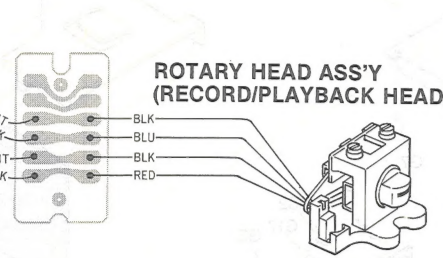
## 8 DIRECT CONNECTOR (A) CIRCUIT BOARD



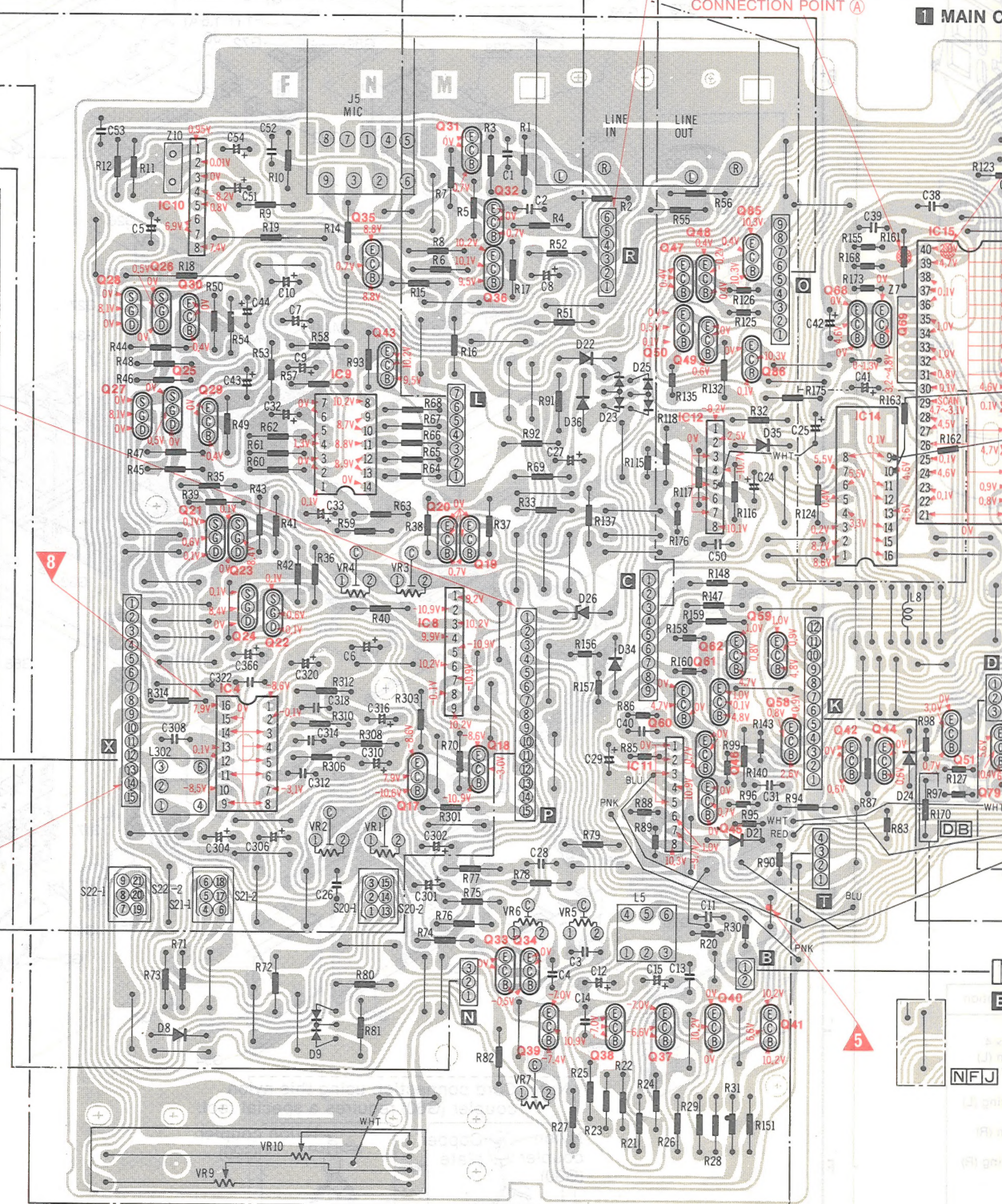
- CONNECTOR 8
- 1 LINE OUT (L-CH)
  - 2 GROUND
  - 3 LINE OUT (R-CH)
  - 4 GROUND
  - 5 LINE IN (L-CH)
  - 6 LINE IN (R-CH)

- CONNECTOR 9
- 1 Record Signal Out (L-CH)
  - 2 B - bias
  - 3 Record Signal Out (R-CH)
  - 4 Bias Oscillator Select
  - 5 Auto Tape Selector Signal Out (CrO<sub>2</sub>)
  - 6 Auto Tape Selector Signal Out (Metal)
  - 7 GROUND
  - 8 B + bias
  - 9 Bias Oscillator (L-CH)
  - 10 Bias Oscillator (R-CH)
  - 11 Playback Signal In (R-CH)
  - 12 B - bias
  - 13 Playback Signal In (L-CH)
  - 14 B + bias
  - 15 DOLBY En/Dc Signal

## 9 HEAD REPEATING CIRCUIT BOARD



- CONNECTOR X
- 1 dbx SIGNAL OUT (L-CH)
  - 2 B - bias
  - 3 dbx SIGNAL OUT (R-CH)
  - 4 B + bias
  - 5 dbx SIGNAL IN
  - 6 GROUND
  - 7 GROUND
  - 8 dbx E/D SIGNAL
  - 9 B + bias
  - 10 PLAYBACK SIGNAL IN (L-CH)
  - 11 RECORD SIGNAL OUT (R-CH)
  - 12 NR ON/OFF SIGNAL
  - 13 RECORD SIGNAL IN (L-CH)
  - 14 PLAYBACK SIGNAL IN (L-CH)
  - 15 RECORD/PLAYBACK SELECT



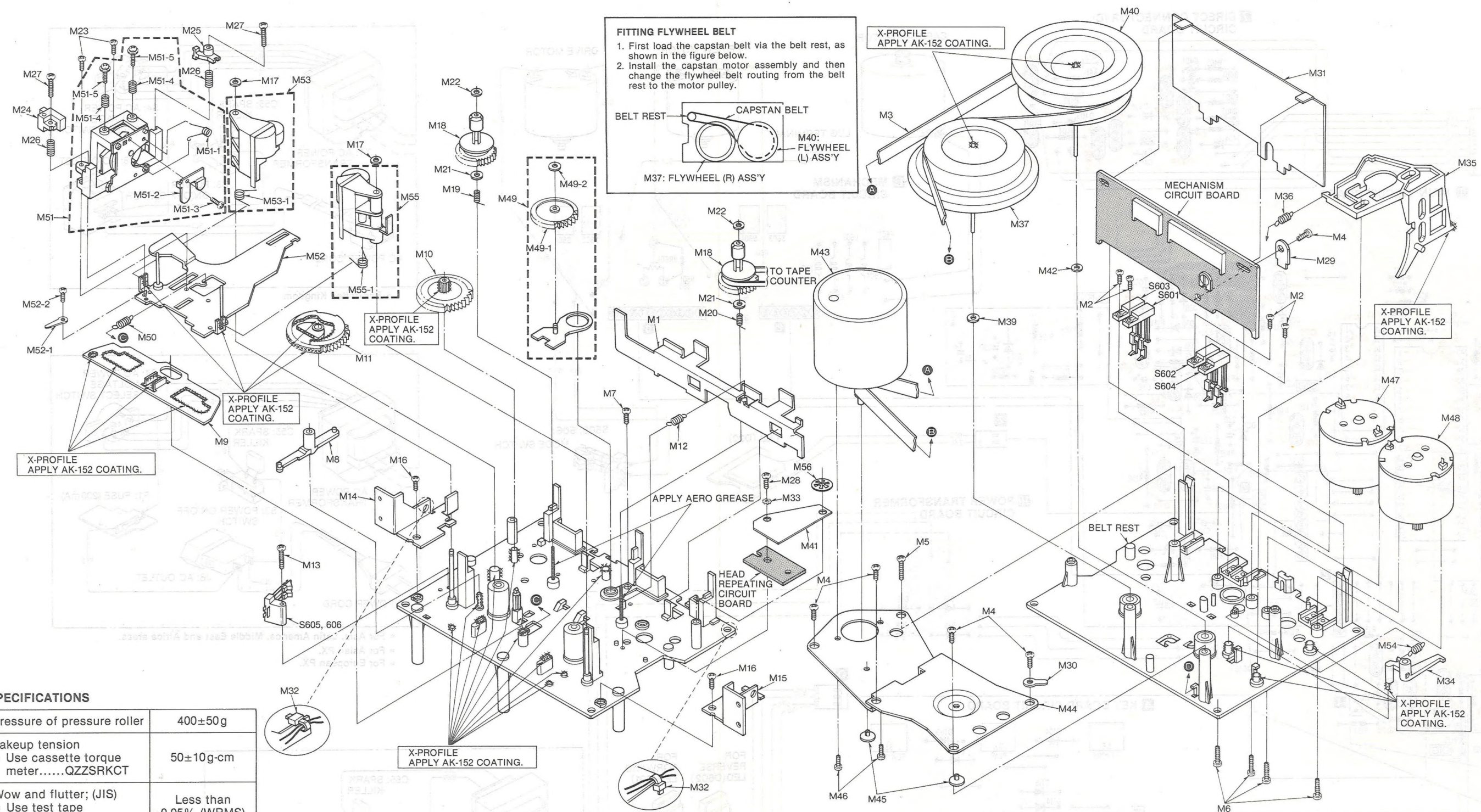
- NOTES:
- BLK .....Black
  - BLU .....Blue
  - BRN .....Brown
  - GRY .....Gray
  - GRN .....Green
  - L. BLU .....Light Blue
  - NIL .....No Color Mark
  - ORG .....Orange
  - PNK .....Pink
  - RED .....Red
  - SLD .....Shield Wire
  - VLT .....Violet
  - WHT .....White
  - YEL .....Yellow

- NOTES:
- .....For all European areas except United Kingdom.
  - .....For United Kingdom.
  - .....For Asia, Latin America, Middle East and Africa areas.
  - .....For Asian PX.
  - .....For European PX.

- NOTES:
- The circuit shown in on the conductor side indicates printed circuit on the back side of the printed circuit board.
  - All voltage values shown in circuitry are under no signal condition and playback mode with volume control at minimum position. For measurement, use VTVM.
  - This circuit board diagram may be modified at any time with the development of new technology.



## MECHANICAL PARTS LOCATION



## SPECIFICATIONS

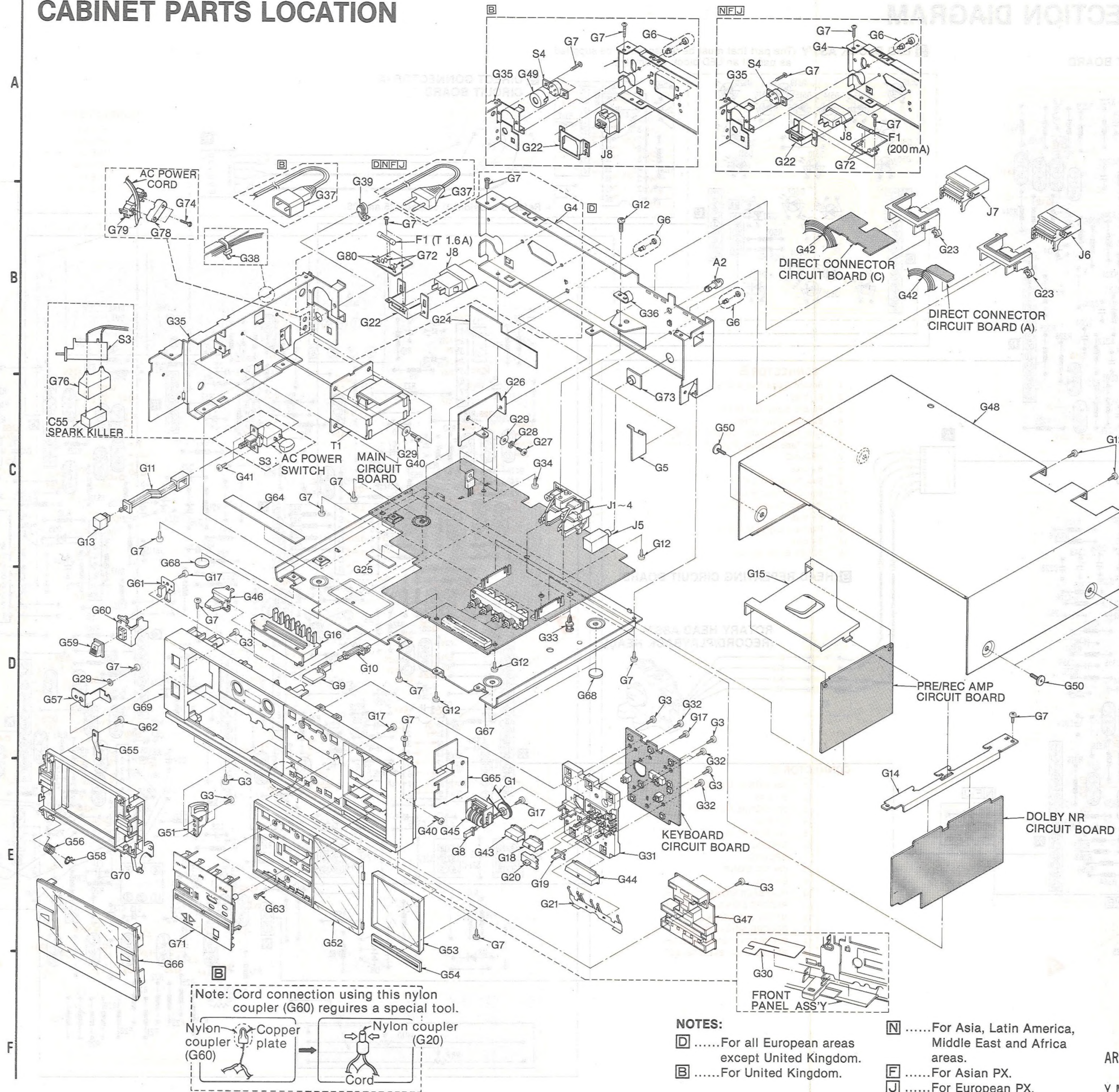
Pressure of pressure roller	400±50g
Takeup tension * Use cassette torque meter.....QZZSRKCT	50±10g-cm
Wow and flutter; (JIS) * Use test tape .....QZZCWAT	Less than 0.05% (WRMS)

## REPLACEMENT PARTS LIST

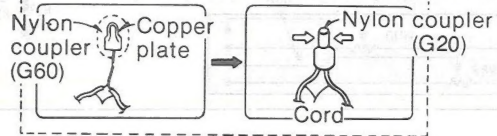
Ref. No.	Part No.	Part Name & Description	Ref. No.	Part No.	Part Name & Description	Ref. No.	Part No.	Part Name & Description	Ref. No.	Part No.	Part Name & Description	Ref. No.	Part No.	Part Name & Description	Ref. No.	Part No.	Part Name & Description
<b>MECHANICAL PARTS</b>			M 11	QDG1309	Main Gear	M 23	XTN26 + 6B	Tapping Screw $\varnothing 2.6 \times 6$	M 36	QBT1947	Head Release Spring	M 49	QXG1076	Center Gear Assembly	M 52-1	QTD1258	Lug Terminal
M 1	QMA4620	Eject Angle	M 12	QBT2003	Eject Angle Spring	M 24	QWY2148Y	Erase Head	M 37	QXF0221	Flywheel (R) Assembly	M 49-1	QDG1307	Center Gear	M 52-2	XTN2 + 4B	Tapping Screw $\varnothing 2 \times 4$
M 2	XTN2 + 8B	Tapping Screw $\varnothing 2 \times 8$	M 13	XTN2 + 18B	Tapping Screw $\varnothing 2 \times 18$	M 25	QMG0124	Tape Guide	M 39	QBW2116	Washer (2.4 $\phi$ )	M 49-2	QBW2007	Washer (2.5 $\phi$ )	M 53	QXL1654	Pressure Roller Arm (L) Assembly
M 3	QDB0347	Flywheel Belt	M 14	QMA4628	Mechanism Angle-L	M 26	QBC1448	Tape Guide Spring	M 40	QXF0220	Flywheel (L) Assembly	M 50	QBT1742	Head Base Plate Spring	M 53-1	QBN1992	Pressure Roller Spring (L)
M 4	XTN3 + 8B	Tapping Screw $\varnothing 3 \times 8$	M 15	QMA4627	Mechanism Angle-R	M 27	XSN2 + 18	Screw $\varnothing 2 \times 18$	M 41	QTW1368	Cover Sheet	M 51	QXV0182	Rotary Head Assembly (Record/Playback Head)	M 54	QBT1962	Stop Lever Spring
M 5	XTN3 + 22B	Tapping Screw $\varnothing 3 \times 22$	M 16	XTN3 + 6B	Tapping Screw $\varnothing 3 \times 6$	M 28	XTN26 + 6B	Tapping Screw $\varnothing 2.6 \times 6$	M 42	QBW2117	Washer (2.7 $\phi$ )	M 51-1	QBN1994	Click Spring	M 55	QXL1655	Pressure Roller Arm (R) Assembly
M 6	XSN26 + 10	Screw $\varnothing 2.6 \times 10$	M 17	QBW2046	Washer (3 $\phi$ )	M 29	QBP1998	Earth Spring	M 43	QXU0331	Capstan Motor Assembly	M 51-2	QBP1993	Head Slide Spring	M 55-1	QBN1993	Pressure Roller Spring (R)
M 7	XTN3 + 6B	Tapping Screw $\varnothing 3 \times 6$	M 18	QDR1173	Reel Table	M 30	QJT0015	Lug Terminal	M 44	QMA4619	Flywheel Retainer	M 51-3	XTN2 + 4B	Screw $\varnothing 2 \times 4$	M 56	QBW0048	Washer
M 8	QML4025	Change Lever	M 19	QBC1449	Reel Table Spring-L	M 31	QTW1342	Insulator Sheet	M 45	QMZ1306	Flywheel Thrust Retainer	M 51-5	QHQ1352	Screw $\varnothing 2.6 \times 3$			
M 9	QMR2096	Change Rod	M 20	QBC1450	Reel Table Spring-R	M 32	QTD1315	Cord Clamper	M 46	XSN26 + 3	Screw $\varnothing 2.6 \times 3$	M 52	QXK2764	Head Base Plate Assembly			
M 10	QDG1308	Sub Gear	M 21	QBW2012	Washer (2.1 $\phi$ )	M 33	XWC265	Washer (2.6 $\phi$ )	M 47	QXU0332	FF/REW Motor Assembly						
			M 22	QBW2008	Washer (2 $\phi$ )	M 34	QML4026	Stop Lever	M 48	QXU0333	Drive Motor Assembly						
						M 35	QMR2097	Eject Rod									



# CABINET PARTS LOCATION



Note: Cord connection using this nylon coupler (G60) requires a special tool.



## NOTES:

- .....For all European areas except United Kingdom.
- .....For United Kingdom.

- [N] .....For Asia, Latin America, Middle East and Africa areas.
- [F] .....For Asian PX.
- [J] .....For European PX.

## REPLACEMENT PARTS LIST

Important safety notice  
Components identified by  $\Delta$  mark have special characteristics important for safety.  
When replacing any of these components, use only manufacturer's specified parts.

Ref. No.	Part No.	Part Name & Description	Ref. No.	Part No.	Part Name & Description
<b>CABINET PARTS</b>					
G 1	QDB0220	Counter Belt	G 51	QYF0627	Damper Gear Holding Angle
G 2 [B] $\Delta$	QJT1079	Nylon Coupler	G 52	QGR0195D	Display Panel (A)
[For United Kingdom.]			"Silver Type"		
G 3	XTN3 + 12B	Tapping Screw $\Phi 3 \times 12$	QGR0195K		
G 4 [D]	QMK2075	Back Chassis	"Black Type"		
[For all European areas except United Kingdom.]			G 53	QGR0196S	Display Panel (B)
[B] QMK2076			"Silver Type"		
[For United Kingdom.]			QGR0196Y		
[NFJ] QMK2077			"Black Type"		
[For PX. For Asia, Latin America, Middle East and Africa areas.]			G 54	QGG0220	Button Guide
G 5	QMA4638	Connector Holding Angle	G 55	QBP1946	Cassette Pressure Spring
G 6	QKJ0609	Nylon Rivet	G 56	QBN2007	Holder Spring
G 7	XTN3 + 8B	Tapping Screw $\Phi 3 \times 8$	G 57	QMA4626	Holder Angle (L)
G 8	QGO2250	Counter Button	G 58	XUBQ4FT	Stop Ring
G 9	QGO2245	Push Button	G 59	QGO2242	Push Button (for Eject)
G 10	QMR2100	Switch Rod	G 60	QML4030	Eject Lever
G 11	QMR2099	Power Rod	G 61	QBP1995	Eject Spring (B)
G 12	XTB3 + 12BFZ	Tapping Screw $\Phi 3 \times 12$	G 62	XTN26 + 5BFZ	Screw $\Phi 2.6 \times 5$
G 13	QGO2243	Push Button	G 63	XTS26 + 8B	Tapping Screw $\Phi 2.6 \times 8$
(Power ON/OFF)			G 64	QTW1343	Insulator Sheet
G 14	QMA4631	P.C.B Holding Angle	G 65	QMA4630	Side Angle (R)
G 15	QMA4632	P.C.B Angle	G 66 [DB]	QYF0636	Cassette Lid Assembly
G 16	QGO2222	Slide Guide	"Silver Type"		
G 17	XTN26 + 8B	Tapping Screw $\Phi 2.6 \times 8$	[For all European areas.]		
G 18	QGO2247	Push Button (REC MUTE)	[DB] QYF0636O		
G 19	QGO2244	Push Button	"Black Type"		
(Music Select/Blank Skip/Music Repeat)			[For all European areas.]		
G 20	QGO2249	Push Button (Timer)	[NFJ] QYF0682		
[For PX. For Asia, Latin America, Middle East and Africa areas.]			"Silver Type"		
G 21	QBP1997	Push Button Pressure Spring	[For PX. For Asia, Latin America, Middle East and Africa areas.]		
[NFJ] QYF0682O			Cassette Lid Assembly		
G 22	[DNFJ] QMA4663	AC Outlet Angle	"Black Type"		
[For PX. For all European areas except United Kingdom, Asia, Latin America, Middle East and Africa areas.]			[For PX. For Asia, Latin America, Middle East and Africa areas.]		
[B] QMA4664			G 67	QYB0431	Bottom Cover Assembly
[For United Kingdom.]			G 68	QKA1094	Case Foot
G 23	SHR9631	Direct Connector Holding Plate	G 69	QYP1192D	Front Panel Assembly
G 24	QTW1354	Insulator (B)	"Silver Type"		
G 25	QBM1335	Cushion	QYP1192K		
G 26	QTH1181	Heat Sink	"Black Type"		
G 27	XSN3 + 8S	Screw $\Phi 3 \times 8$	G 69-1	(refer to D20)	Cassette Holder
G 28	XWA3G	Washer $3\phi$	G 70	QYF0659	Assembly
G 29	XWG3	Washer $3\phi$	Cassette Holder		
G 30	QTS1612	Head Shield Sheet	G 71	QYK0163	Operation Plate Assembly
G 31	QMK2094	Operation Chassis	G 72	[D] $\Delta$ QTF1054	Fuse Holder
G 32	XTN26 + 8BFZ	Tapping Screw $\Phi 2.6 \times 8$	[For all European areas except United Kingdom.]		
G 33	QKJ0608	Tapping Support	[NFJ] $\Delta$ QTF1060		
G 34	XSN3 + 6BVS	Screw $\Phi 3 \times 6$	[For PX. For Asia, Latin America, Middle East and Africa areas.]		
G 35	QMA4629	Side Angle	G 73	QKJ0667	MIC Jack Holding Plate
G 36	RME143Z	Cord Clamper	G 74	XTN3 + 20B	Tapping Screw $\Phi 3 \times 20$
G 37	[DNFJ] $\Delta$ SJA151	AC Power Cord	G 76	QTW1195	Spark Killer Cover
[For PX. For all European areas except United Kingdom, Asia, Latin America, Middle East and Africa areas.]			G 78	QTD1164	Cord Bushing
[B] $\Delta$ SJA1491			G 79	QTD1322	Cord Clamper
[For United Kingdom.]			G 80	$\Delta$ SJT777	Pin Terminal
G 38	QTD1315	Cord Clamper	<b>ACCESSORIES</b>		
G 39	QBJ1425	Cord Bushing	A 1 [DBN] QQT3511	Instruction Book	
G 40	XTN3 + 6B	Tapping Screw $\Phi 3 \times 6$	[For all European areas, Asia, Latin America, Middle East and Africa areas.]		
G 41	XTN3 + 5B	Tapping Screw $\Phi 3 \times 5$	[FJ] QQT3519		
G 42	QTD1181	Wire Clamper	[For PX.]		
G 43	QXB0790	Push Button (Record)	A 2	SHE135	Fixing Pin
G 44	QXB0791	Push Button (Pause)	"Silver Type"		
G 45	QDC0162	Counter	SHE135-1		
G 46	QYT0665	Slide Knob Assembly	"Black Type"		
G 47	QVDLX020	LED Block Assembly	<b>PACKINGS</b>		
G 48	QGC1241	Case Cover	P 1 [DB] QPN4478	Inside Carton	
"Silver Type"			[For all European areas.]		
QGC1241K			[FJ] QPN4488		
"Black Type"			Inside Carton		
G 49 [B]	QTW00026	Rotary Switch Cover	[For PX.]		
[For United Kingdom.]			[N] QPN4487		
G 50	QH01349	Ornament Screw	[For Asia, Latin America, Middle East and Africa areas.]		
"Silver Type"			P 2	QPA0729	Cushion
QH01349K			P 3	QPA0730	Cushion
"Black Type"			P 4	QPS0673	Pad
			P 5	XZB40X50A02	Poly Bag
			P 6	QPC0072	Poly Sheet

ARD DDK B BK N NK F FK J JK  
Y.M